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Veterinary Medicine

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Report of the 59th Annual Meeting, United States Livestock Sanitary Association (Abstracts and notes of papers and committee reports)

Advances Made in Swine Practice, Part III

Feline Infectious Anemia

Trichomonas spp. in Feline: Case Report

Dogs as Hosts of Tularemia and Vector Ticks

Hypothermia by Cold Temperatures

Carbomycin in Canine Distemper Complex

Review of Progress in Veterinary Medicine—1955

(Complete Index on Page VIII)

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Fred Gasow, D.V.M., and Edwin Oje, D.V.M.
Gasow Veterinary Hospital, Birmingham, Michigan.
The Clinical Use of Chloromycetin in Canine Ocular Infections
W. G. Magrane, D.V.M.
Mishawaka, Ind.
A. S. Schlingman, D.V.M., M.Sc., and Mary C. Manning, B.S.
Research Laboratories, Parke, Davis & Co., Detroit, Mich.
Chloromycetin Therapy in Veterinary Medicine
J. W. EASTMAN, D.V.M.; A. S. SCHLINGMAN, D.V.M., M.S.; MARY C. MANNING, B.S.; F. E. EADS, D.V.M., M.S.
Rochester and Detroit, Michigan
Chloromycetin* Therapy in An Outbreak of Hard Pad
M. B. TOOSEY, M.R.C.V.S.
WIMBORNE, DORSET
Chloromycetin Palmitate in Small-Animal Medicine
Elroy C. Jensen, D.V.M.
Chloromycetin Palmitate in the Treatment of Kennel Cough
James E. Cook, D.V.M.
Holland, Mich.
The Clinical Use Of Chloromycetin In Dogs And Cats
by
R. G. SCHIRMER, D.V.M., F. E. EADS, D.V.M., M.S.
Blood Level Studies in Dogs Following the Administration of Chloromycetin
F. E. EADS, D.V.M., M.S.; A. J. GLAZKO, Ph.D.; L. M. WOLF, JOHN EHRLICH, Ph.D.; M. GALBRAITH, M.S.
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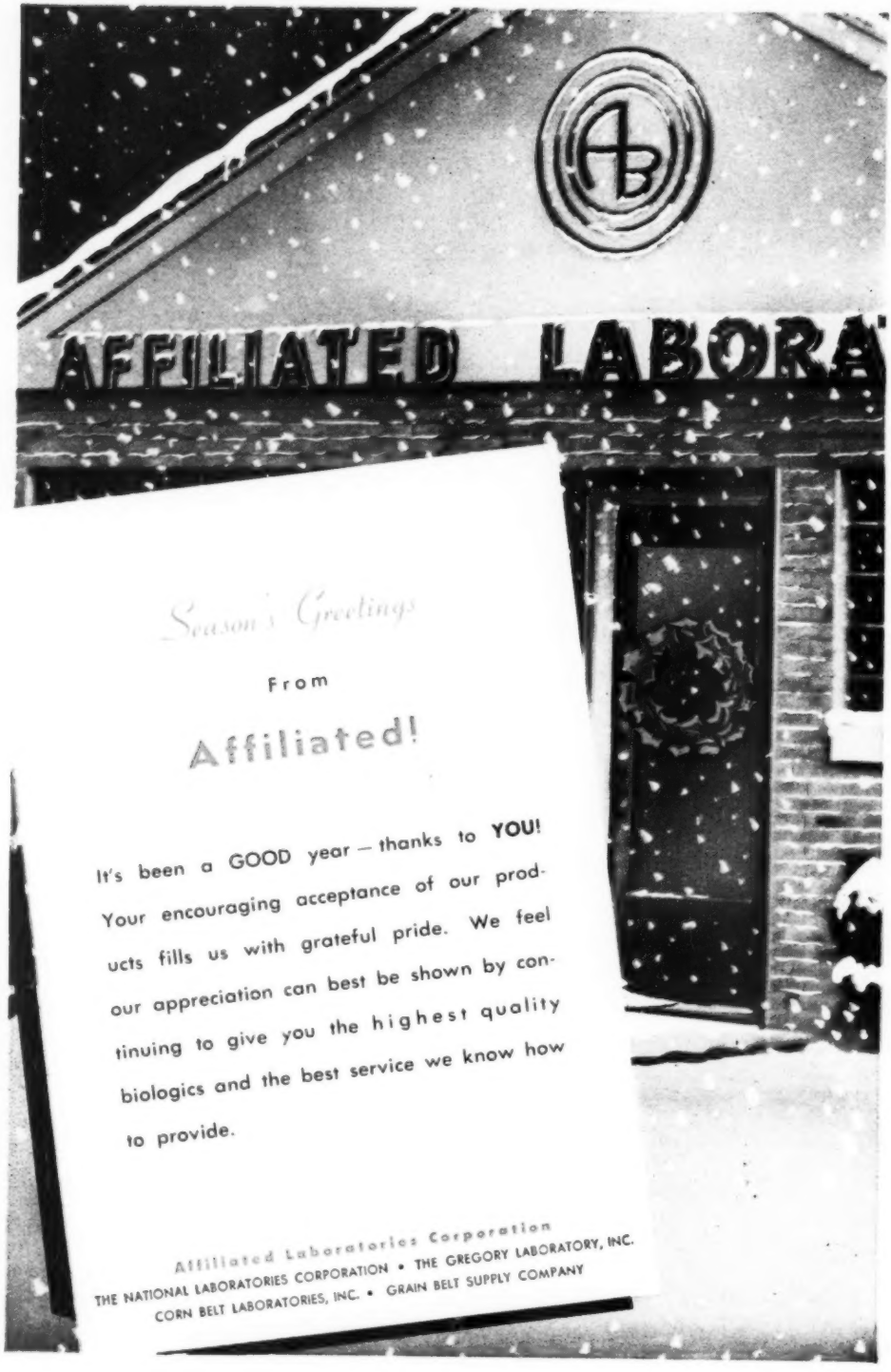

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Mobilization for Disease Control

A discussion was presented before the recent annual meeting of the U.S. Livestock Sanitary Association in which a general plan was outlined by Dr. F. J. Mulhern of the Agriculture Research Service for emergency disease control.

Cognizance was taken of existing potential for diseases of animals to spread over wide areas before symptoms become manifested in those exposed to infections that might have been introduced inadvertently, or with malicious intent. Considerable emphasis has been placed on these facts drawing attention to limitation of barriers so far generally adequate. Revision of disease control measures are essential for the continued assurance that they are paced in proportion to the dangers.

No less than mobilization of every individual trained in veterinary science can be depended upon in the event of conceivable tragedy to American livestock. Certainly existing control forces could be expected to do little more than direct a large-scale effort. A mobilization plan will serve a multiple purpose. Not only will practitioners and others be embraced in a plan to cope with an emergency, but general educational purposes will be served. Cooperation of all agencies could then be expected, which would be desirable and necessary for successful accomplishment of a mission.

It is hoped the plan will materialize in such detail that every veterinarian will appreciate the importance of his active participation to his community.

Modern Farm Trends

Veterinarians are urged to consider changing trends in agriculture in order to adjust their own practices and methods of doing business to suit these obvious changes. Example is the growing importance of change to larger and larger farm units. Efficiency and low cost production technics have made these mechanized farm factories a factor with which to reckon. Ingenuity must be practiced to meet ever changing and new conditions.

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In This Issue . . .

Report of the 59th Annual Meeting, U. S. Livestock Sanitary Association, New Orleans, Louisiana ... 1
Virus Diarrhea and Mucosal Disease of Cattle ... 3
Report of Status of Animal Disease Control ... 5
Specificity of the Complement-Fixation Test for Anaplasmosis ... 5
Complement-Fixation Test as an Aid in the Control of Bovine Anaplasmosis ... 6
Infectious Rhinotracheitis of Cattle ... 6
Leptospirosis in Swine ... 7
Epizootiology of Vesicular Exanthema in California ... 8
Transmission of Vesicular Stomatitis in Swine ... 9
Nation-wide Eradication of Hog Cholera ... 10
Swine Brucellosis ... 10
The Derringue Problem in Mexico ... 11
Chronic Respiratory Disease of Poultry ... 12
Committee Reports ... 13-15

General Practice . . .
Advances Made in Swine Practice. Part III: Swine Leptospirosis—H. C. Smith ... 33

Small Animal Practice . . .
Feline Infectious Anemia—Earl J. Splitter, Edin R. Castro, and Wendell L. Kanawyer ... 17
Trichomonas spp. in Feline: A Case Report —Helen E. Jordan ... 23
Dogs as Hosts of Tularemia and Vector Ticks in Central Arkansas—Ernest L. Calhoun, Carl O. Mohr, and Hugh I. Alford, Jr. ... 25
Hypothermia by Cold Temperatures—Robert P. Knowles and Stanley C. Wasman ... 26
A.A.H.A. Question and Answer Luncheon ... 27
Carbomycin in Canine Distemper Complex—Leo L. Lieberman ... 28

Editorial Comments . . .
VM News Comment ... VII
Animal Fats Charged as Cause of Heart Disease ... 24
Veterinary Open House at Washington State College ... 30-31
American Public Health Association Meeting ... 32
Rabies Control Week in St. Louis, Mo. ... 32
Foot-and-Mouth Disease Vaccine ... 37
Stilbestrol Experiments Reveal Average 16% Gain ... 37
Review of Progress in Veterinary Medicine —1955 ... 38
D. V. M. Insurance Plan ... 39
"Recombined Milk" ... 40
The W. W. Dimock Animal Pathology Building ... 40
X-ray Motion Pictures ... 41
Ralston-Purina Announces Research Fellowship Awards for 1956-57 School Year ... XXIX
Increases in Salary for Federal Veterinarians ... XXXII
Principles of Animal Health ... 16
Poultry Practice Problems—R. R. Dykstra ... 42
Veterinary Parasitology—A. O. Foster ... 44
Veterinary Nutrition—Morris Erdheim ... 45

Book Reviews . . .
The Merck Veterinary Manual—edited by the Merck professional staff ... 46
Russian Comfrey—Lawrence D. Hills ... 46
Meeting Calendar ... XLI
Necrology ... XLII

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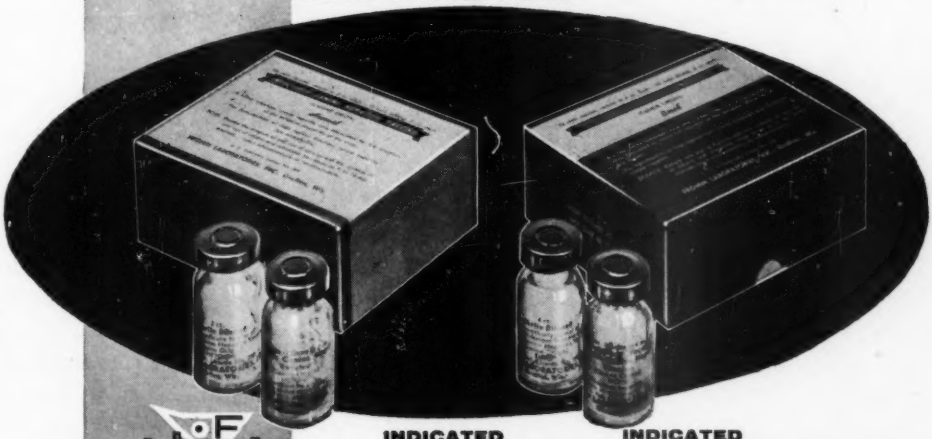

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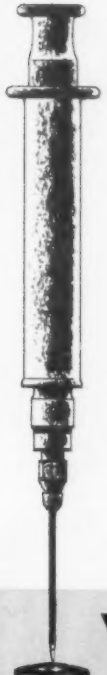

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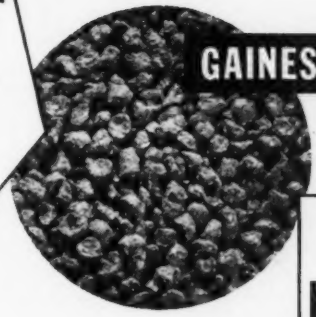

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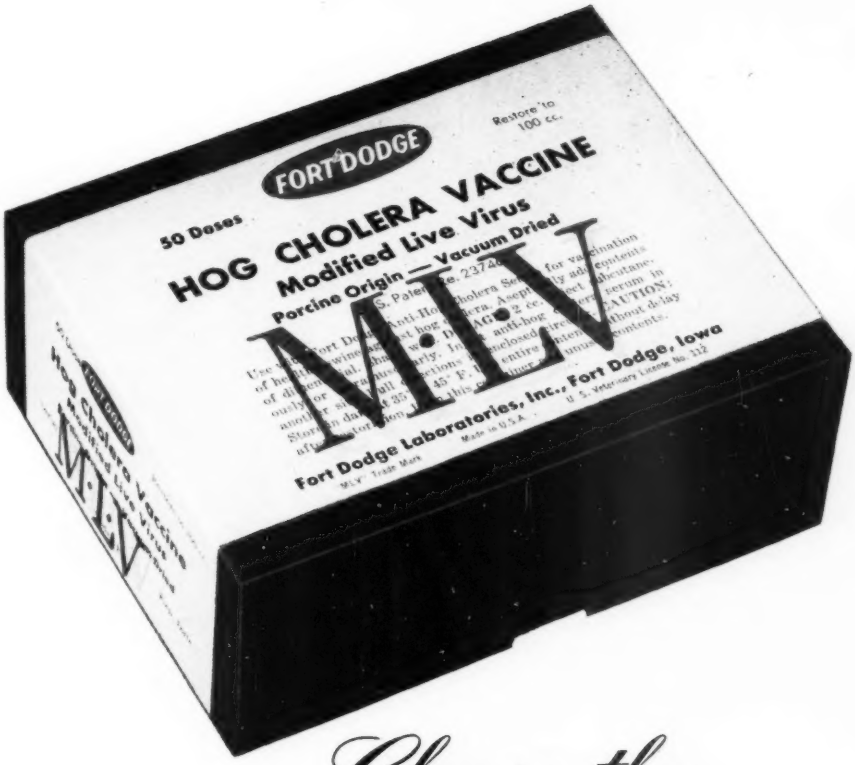

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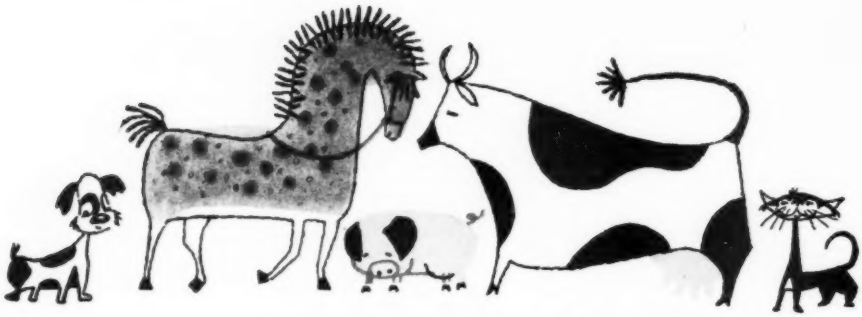

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1. Rachman, M., and Frucht, T. R.: Vet. Med. *49*:341, 1954.
2. Sternfels, M.: Vet. Med. *50*:82, 1955.

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NEO-600 is a new and effective weapon in your fight against mastitis.

References:

[1] Drury, A.R.: Vet. Med. 47: 407-411, 1952.

[2] Kitchen, H., and Waksman, S.: J.A.V.M.A., Vol. 127, No. 942: 261-274, Sept., 1955.

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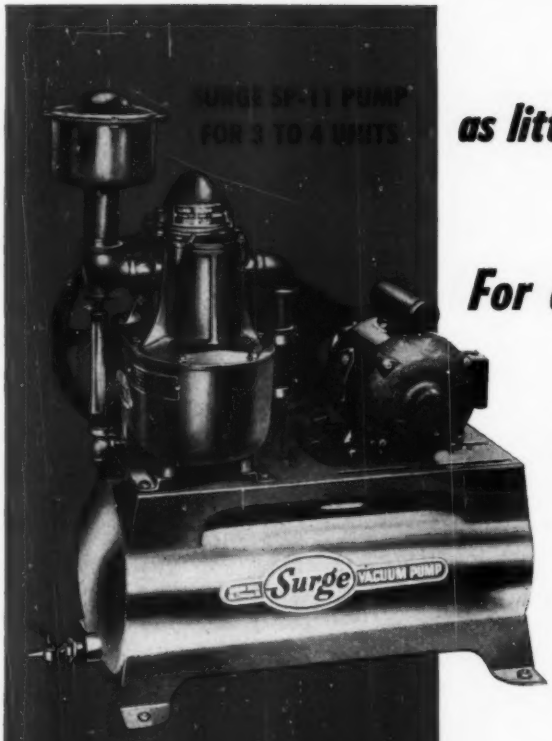

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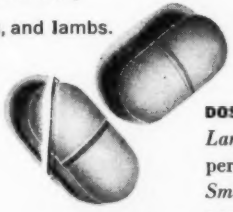

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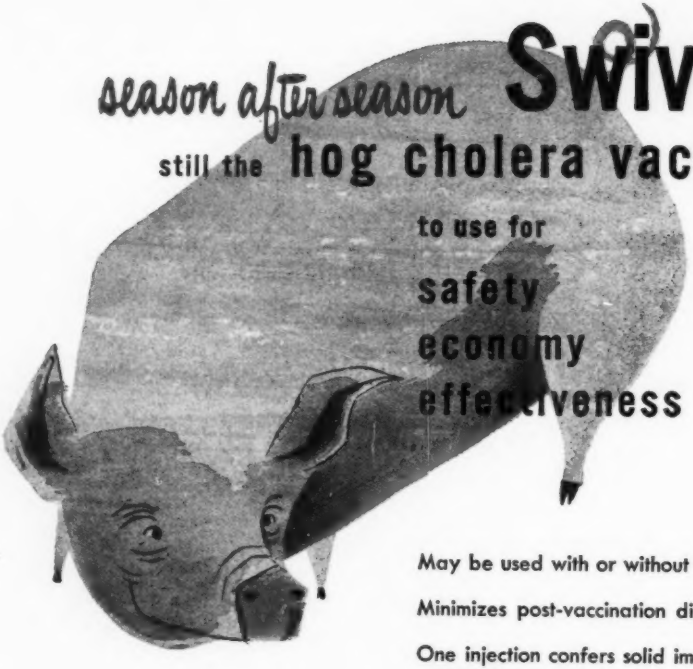

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Report Of The Fifty-Ninth Annual Meeting, U. S. Livestock Sanitary Association, New Orleans, Louisiana

THOSE in attendance at the 59th annual meeting of the United States Livestock Sanitary Association that convened in New Orleans, Louisiana, November 16 to 18, 1955, were particularly impressed and pleased by reports of a large group of well qualified investigators that gave evidence of fruitful probing for answers to many disease problems. None of these were sensational or likely to effect drastic changes in methods now applied in sanitary science but served to illustrate many instances of profound research. Additional knowledge has been acquired that will be of inestimable value in prevention and control of diseases that are directly responsible for losses to growers and that affect national wealth.

New Jersey State Veterinarian, Dr. R. A. Hendershott, secretary-treasurer since 1943, and one of the leading figures contributing to the guidance and advancement of the Association, expressed confidence in Association activities and plans. The good service rendered by livestock officials of the Agricultural Research Service, the states, and territories by the application of newer knowledge to livestock sanitary science can not be measured accurately in dollars but continues to be one of the most valued services of civil government.

Organization changes referred to the Executive Committee for action included the provision for recognizing the Los Angeles County Livestock Sanitary Association as an entity and qualified to be represented on the Executive Committee.

Dr. A. L. Brueckner, Baltimore, Maryland, President of the United States Livestock Sanitary Association.

President's Address

Dr. H. F. Wilkins, Montana state veterinarian and retiring president, opened the sessions by stating the objectives of the group are as follows: "We are gathered here to acquire such additional knowledge as will better fit us to serve the people we represent and to thrash out and solve, to the best of our abilities, many controversial matters of vital concern to public health and to the livestock and allied industries."

He referred specifically to practical eradication of brucellosis, tuberculosis, and hog cholera. He emphasized that by coordination of effort, complete eradication of these three diseases, for years major plagues of livestock, within the forseeable future; brucellosis by 1960, tuberculosis by 1965, and hog cholera by date depending upon future action to be taken to prevent spread of the infectious agent.

President Wilkins pointed out the immense value of brucellosis vaccination program in both dairy and beef heifers. He stated that general vaccination is the most important single

factor which will assure success of the program for eradication and which can be expected to safeguard against spread should our cattle population become susceptible before all sources of infection can be removed from our herds. He also voiced a generally prevalent opinion that the progress of the National Brucellosis Eradication Plan, instituted a year ago, is proving effective. He expressed gratification in the fact that "the cattle industry now is being saved no less than $55,000,000. each year as a result of the reduction of the disease thus far."

In referring to bovine tuberculosis, Doctor Wilkins urged furthering effort of identification of all slaughter animals to assure that in event of condemnation for tuberculosis lesions, origin may be traced promptly and easily. Close liasion of inspection and disease regulatory personnel is essential to prompt, economical location of infectious foci.

Hog cholera, the most costly disease of swine for over 50 years among a present population of over 100,000,000 animals, has been a subject of discussion since the early meetings of this group but actually little has been done about eradication. This is not because of lack of precedence — the disease does not exist in neighboring Canada. As early as 1916 Dr. D. F. Luckey, then state veterinarian of Missouri, demonstrated that by the use of measures even then used by competent personnel extension of the disease could be prevented. The key to eradication, he stated, is in restriction of movement of the disease virus in the infected animal, pork products, and in a bottle. He asked if cholera-infected and exposed pigs should be handled any differently than cattle infected or exposed to foot-and-mouth disease.

Doctor Wilkins commented favorably on progress made toward uniformity of interstate regulations and called for concerted effort to perfect features that may prove acceptable as a standard.

Resolutions

1. Regulatory Laboratory Facilities. Urges that the Secretary of Agriculture, Director of the Budget, and members of the Senate and House Committees on Agriculture and Appropriations provide funds necessary to construct, staff, and maintain new laboratory facilities adequate for performing essential research, regulatory, and diagnostic services disrupted by closing the laboratory in Washington, D. C. and curtailment of activities of laboratories in Denver, Colorado, and Auburn, Alabama.

Dr. R. A. Hendershott, Trenton, New Jersey, Secretary-Treasurer of the U.S. Livestock Sanitary Association.

2. Requests the Secretary of Agriculture to establish office and section within the Animal Disease Eradication Branch, A. R. S. and provide necessary funds to work out practical means of identifying cattle so that tuberculous carcasses can be traced to points of origin.

3. Establish facilities for the purpose of developing and carrying out testing methods which will assure the safety and potency and establish adequate standards of quality of all veterinary biologics.

4. Endorses and recommends that an additional $10,000,000. be authorized for brucellosis eradication for the remainder of the current fiscal year and that funds not to exceed $30,000,000. annually be authorized and provided for the two fiscal years following.

Officers

Unanimous action was taken on the recommendations of the Nominating Committee for

new officers to serve the Association for the coming year. Elected and installed were: Dr. A. L. Brueckner, Baltimore, Maryland, president; Dr. G. H. Good, Cheyenne, Wyoming, 1st vice-president; Dr. J. Milligan, Montgomery, Alabama, 2nd vice-president; Dr. H. U. Garrett, Des Moines, Iowa, 3rd vice-president. Dr. R. A. Hendershott, Trenton, New Jersey, was reemployed as secretary-treasurer.

It was announced that the annual meeting for 1956 will be held in Chicago, Illinois, and for 1957 at St. Louis, Missouri.

The 1955 Annual Report

The quotations, abstracts, notes, and excerpts appearing on succeeding pages in this issue devoted to the deliberations of livestock sanitary authorities all over the nation, represent this reporter's interpretation of opinions expressed by speakers. Report is not an abridgement, nor has there been any attempt to do other than cover briefly salient highlights selected as most important to the profession as a whole and to practitioners especially. Complete report of this three-day session, with all papers, committee reports, and discussions will be published in full shortly after the first of the year. In this will be much useful material for all veterinarians interested in disease control. Readers are urged to take advantage of the opportunity for individual (not official) membership in the U.S. Livestock Sanitary Association, if for no other reason than to avail themselves of the proceedings.

For further information, application blanks, et cetera address the secretary, Dr. R. A. Hendershott, 33 Oak Lane, Trenton, New Jersey. Membership dues are $5. annually.

▾ ▾ ▾

The United States Department of Agriculture, Special Report No. 34, entitled Contageous Diseases of Domesticated Animals, published in 1881, carries translation of a group of publications appearing in France, relating to experiments by M. Pasteur as to the cause and manner of transmission of contagious diseases among domesticated animals. One of the most deadly diseases of that time among both cattle and sheep was anthrax, called *charbon*. This scourge had been known for many years in all countries and farmers considered themselves fortunate if losses did not exceed 3 to 5% of their herds and flocks. Many instances were cited of disastrous losses, even dissemination of all susceptible animals on certain pastures.

VIRUS DIARRHEA AND MUCOSAL DISEASE OF CATTLE

Notes of an address presented by W. R. Pritchard, D.V.M., Ph.D., R. D. Carlson, D.V.M., M.S., H. E. Moses, D.V.M., M.S., and Davis Taylor, Ph.D., Lafayette, Indiana.

Though similar in many respects, sufficient to support close relationship, virus diarrhea and mucosal disease have some immunological differences. As studies progress in the laboratory and of field cases, evidence is emerging suggesting the likelihood that virus diarrhea, as observed in New York and Indiana, are the same disease, both differing from mucosal disease.

Virus Diarrhea

Virus diarrhea was reported first from New York state in 1946, as a contagious disease of cattle characterized by elevated body temperature, nasal discharge, and diarrhea. Since that time, similar disease syndrome has been reported in 20 states and in Sweden. In Sweden, the disease was designated as epizootic enteritis and became widespread over that country during 1946-48.

The senior author and speaker described virus diarrhea as observed in Indiana in 1954. Symptoms included: Sudden onset, fever, and anorexia. Later, a nasal discharge developed in affected animals which was described first as serous, later becoming mucus in character.

A nonproductive cough was observed frequently. Nasal discharge became heavy as the course of the disease developed with mucus covering the muzzle and frequently hanging from it to the ground. Mouth lesions occurred on the dental pads as elongated or circular, superficial erosions in 10% of the cases examined. Early in outbreaks lesions were observed on the muzzle and/or vulva of some affected cattle. Lameness (laminitis) was evident by reluctance of animals to stand. Approximately 10% of field cases exhibited lameness. Diarrhea was profuse in the early febrile stages with blood and mucus passages for about one week, after which soft feces with heavy mucus, resembling egg albumin, was passed. With the severe diarrhea, accompanying dehydration with rapid weight loss was observed commonly. Morbidity ranged up to 100% of affected herds. Mortality among affected cattle ranged from 5 to 10% and up to 50% in selected outbreaks. All ages of cattle are affected. Those in the eight-months to two-year age group appear to be most susceptible to

infection. Young calves exhibited resistance.

Nature of lesions generally are described as hemorrhage, congestion, and erosion of the mucous membrane of the alimentary canal. Superficial erosion is observed, at autopsy, in the esophagus and abomasum; catarrhal enteritis with erosions in the large and small intestines.

Histopathological study reveals the marked loss of epithelium over all the digestive tract without cellular infiltration, apparently as a lyphoid exhaustion phenomenon. Symptoms of the disease may be reproduced by intravenous injection of blood of febrile animals into susceptible cattle.

Mucosal Disease

Mucosal disease is characterized by sudden onset, fever, depression, anorexia, and congestion of oral mucosa, with erosion evident within two or three days after symptoms appear. Lacrimation and nasal discharge, the latter voluminous and having a putrid odor, accumulates over the muzzle. Owners speak of "putrid slobbers" in referring to these cases. Superficial type of erosion can be found on most any portion of the oral mucosa. Prominent also is diarrhea with fluid feces passed, mixed with mucus and blood, with tenesmus.

Chronic cases become severely dehydrated and scurvy scales appear on the skin. Course varies from four days to eight months.

All age cattle are susceptible; highest incidence rate among eight- to 14-month-old steers and heifers during winter months. Mortality is high among affected animals.

Pathological Changes

Congestion and hemorrhage of mucosa of the alimentary tract with erosion are cardinal signs of this disease. Erosion occurs on the dorsal surface of the tongue, palate, buccal mucosa, esophagus, rumen, omasum, and abomasum.

Differential diagnosis between mucosal disease and virus diarrhea clinically is difficult. Difference is primarily one of severity (mucosal disease is most serious) and character of epithelial erosion. Those on the dorsum of the tongue have been described only for mucosal disease. Morbidity in field outbreaks of virus diarrhea is high, up to 100%, whereas that for mucosal disease is low usually and may affect only a single animal in a herd. Symptom chart, prepared by the authors, illustrates the fine clinical distinctions that nevertheless are significant. Much research is needed to determine the exact relationships of these diseases to each other.

Comparison of Bovine Diseases with Mucosal Erosions*

Reference	Rinderpest	Mucosal Disease	Indiana Virus Diar.	New York Virus Diar.	Rhinotracheitis
Incubation	3-5 days	2-8 days	2-5 days	3-7 days	3-5 days
High temperature	yes	yes 2-3 days	yes	yes	yes
Leucopenia	yes, severe	yes	yes	yes	no
Rhinitis	yes	yes (occasionally)	yes	yes	yes
Lacrimation	yes	yes (inconstant)	no	no	yes (inconstant)
Diarrhea	yes	yes	yes	yes	no, 10% (secondary)
Buccal erosions	yes	yes	yes	yes	no
Eros. dorsum tongue	no	yes	no	no	no
Infl., hemo., erosion digestive tract	yes	yes	yes	yes	no
Lymphoid tissue damage	yes, severe	yes	yes, mild	yes ?	edema, hem
Corneal opacity	no	yes, 10%	rare, calves	no	no
Lameness	no	yes, 10%	yes, 10%	no	no
Morbidity (field)	100%	2-50%	80-100%	33-88%	25%
Mortality	90-100% U.S.	90%, clinical cases	0-50%	4-8%-50	3%
Transmissible agt.	yes	yes	yes	yes	yes
Immune-animals	yes	yes	yes, 4 months	yes	yes
Immune serum	yes	?	?	?	?
Neutralization test	yes	?	?	?	?
					not an erosive disease of the digestive tract.

*Mucosal Disease Committee, U. S. Livestock Sanitary Association, Dr. W. R. Pritchard, chairman.

REPORT OF STATUS OF ANIMAL DISEASE CONTROL

Abstract of report presented by R. J. Anderson, D.V.M., Chief, Animal Disease Eradication Branch, Agricultural Research Service, USDA, Washington, D. C.

A force of 2,000 employees, assigned to six separate sections of the Animal Disease Eradication Branch of the Agricultural Research Service are charged with the duties and responsibility of this service. These include supervision of interstate movement of animals through public stockyards, enforcement of federal quarantines, and collection and dissemination of statistical information of concern to sanitarians, livestock growers, and others allied to the field. Regular employees are supplemented by approximately 6,000 veterinarians who are employed on a fee basis. The full, potential force for disease eradication embraces all veterinary medicine and, as set up, constitutes the strongest possible animal health police body.

This report dealt with a number of diseases of current interest. Positive action has been taken in all cases with a rather encouraging degree of success.

Vesicular Exanthema. Over 83% of 14,000 garbage feeders are now cooking garbage. Areas now under quarantine include counties in California and in five states on the east coast — New Jersey, Massachusetts, New York, Rhode Island, and Connecticut. In three of the latter group only a few premises are involved. Inspection to assure proper cooking and sanitation has improved in most states, and in these is considered adequate.

Anaplasmosis. An eradication trial, based on the complement-fixation test, is being undertaken in the Territory of Hawaii. Incidence there is low and eradication of the disease from the Islands appears favorable.

Scabies. An old disease that has been responsible for tremendous losses on Western ranges has broken out repeatedly in recent years involving limited areas. It can be eradicated. Vigilance in early detection and institution of prompt treatment measures can be depended upon to confine isolated outbreaks in both sheep and cattle.

Scrapie. This disease of sheep caused alarm recently and is of concern primarily because of its characteristically long incubation period. Since 1947, the disease has been diagnosed in 34 flocks in a total of 11 states; eight of these reporting infected animals during fiscal 1955.

Bluetongue. Seven states reported bluetongue during the past season. Average mortality is 10% of affected animals although mortality experience in some flocks is considerably more.

Animal Disease Reporting System

The Animal Disease Eradication Branch has been charged with the responsibility for setting up a system for collection, correlation, and dissemination of statistics on animal diseases. Progress toward accomplishment of this mission is now evident in plans which include various grass-root organizations. Operations are expected to begin on January 1, 1956.

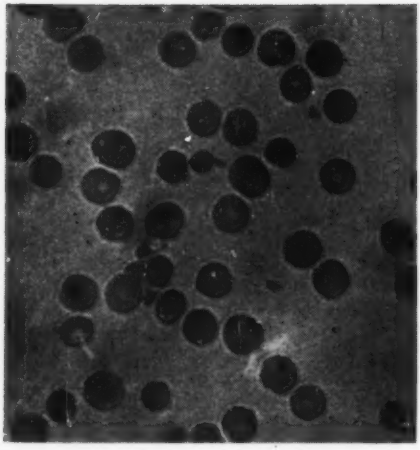
SPECIFICITY OF THE COMPLEMENT-FIXATION TEST FOR ANAPLASMOSIS

Notes from an address by D. W. Gates, V.M.D., M.S., T. O. Roby, D.V.M., M.S., and L. O. Mott, D.V.M., USDA, Agriculture Research Service, Animal Disease and Parasite Research Branch, Beltsville, Maryland.

The authors point out that before any serological procedure has diagnostic value, its usefulness must be ascertained accurately. It also must be shown that the presence of other diseases or their antibodies do not give cross reaction to the antigen. In the case of the complement-fixation test for anaplasmosis, the question has been raised as to whether or not prevalent vaccination of calves with *Br. abortus* strain 19 would influence complement-fixation reaction. Studies were set up to determine this point.

Previous reports have revealed the accuracy of the complement-fixation test for anaplasmosis. It is becoming widely accepted as a diagnostic tool for selection of positive or carrier animals. A highly sensitive antigen, long sought by researchers in anaplasmosis, is now available, having the required sensitivity to detect infected carrier animals as well as acute and subacute cases. Antibody levels of carrier animals are usually low, emphasizing the necessity for a dependable and reliable product. Obviously, the value of selection or culling on the basis of the test depends on its ability to identify every carrier animal. A single carrier in a herd is a massive source of infection for susceptible animals.

Cattle infected with brucellosis, vibriosis, and vesicular stomatitis were examined by the complement-fixation test for anaplasmosis. Results were correct in 202 of 204 noninfected



Anaplamia marginale. As high as 50% of the red blood cells may be infected during febrile stage of the disease.

cattle previously vaccinated for brucellosis and positive animals also gave negative tests. A third group of animals, later proved susceptible to *Anaplasma marginale*, yielded negative tests to a determined accuracy of 99.15%.

The authors state that, when carefully conducted, the test is specific. Necessity for using high quality serum, properly preserved, was emphasized. Studies are continuing on the significance of physiological conditions or states on nonspecific reactions. The importance of repeated herd tests also was emphasized because of variables of the disease and test procedures.

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COMPLEMENT-FIXATION TEST AS AN AID IN THE CONTROL OF BOVINE ANAPLASMOSIS

Abstract of paper presented by C. C. Pearson, D.V.M., W. E. Brock, D.V.M., and I. O. Kliemer, B.A., Veterinary Research Station, Pawhuska, Oklahoma.

A tentative plan for controlling anaplasmosis by means of the complement-fixation test is suggested in this report comparing individual animal blood tests of 653 ear-tagged range animals. The results indicate approximately 94% duplication, *i.e.*, animals reacted similarly in two separate annual tests.

On a wider basis, tests on cattle on ranches of a group of eight cooperative owners, totalling 1,682 the first year and 1,082 the second year, revealed striking analogy of results. On each test, approximately 13% of the animals were classified as positive reactors and potential carriers of disease, 2% were suspicious, and 85% negative.

A modification of the Price-Poelma method of antigen preparation (*Am. Jour. Vet. Res.*, 13:149, 1952) was used, which substituted repeated freezing and thawing for water lysis to reduce volume of material to be centrifuged.

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INFECTIOUS RHINOTRACHEITIS OF CATTLE

Notes of papers: Recent Developments on Upper Respiratory Disease of Cattle by D. G. McKercher, D.V.M., Ph.D., J. E. Moulton, D.V.M., Ph.D., J. W. Kendrick, D.V.M., and J. Socto, Davis, California; The Pathology of Rhinotracheitis of Cattle by R. Jensen, D.V.M., Ph.D., L. A. Griner, D.V.M., M.S., and W. W. Brown, Jr., D.V.M., Ft. Collins, Colorado; and Transmission Studies of Rhinotracheitis of Cattle by T. L. Chou, D.V.M., and A. W. Deem, D.V.M., M.S., Ft. Collins, Colorado, presented by respective senior authors.

Studies in a number of laboratories located in states where an apparently new respiratory disease of cattle has occurred have been productive sufficiently to reveal the entity and its characteristic symptoms and lesions. The disease has been referred to variously as infectious rhinotracheitis, anterior or upper respiratory disease of cattle, and "red nose."

The disease was recognized in Colorado in 1950 but probably had existed prior to that time. Since recognition, the incidence of the anomaly has increased annually, and in 1954 was considered to be the most important single disease of feed-lot cattle.

As observed both in California and Colorado, it appears to be restricted to fattening cattle in feed-lots. It has not been observed in range stock even though these may be in rather close proximity to those on feed. Animals of all ages and degree of finish may be affected as early as two weeks after introduction to standard feed lot conditions. Whether carrier animals exist to spread the disease by close contact or if, indeed, animals are incubating the infection when placed in lots has not been determined.

Clinical Signs

The clinical picture includes sudden, explosive onset of extremely acute illness affecting most animals in a lot within ten days. This acute stage is marked by anorexia and elevation of body temperature to 108 F. Excessive salivation is a prominent symptom. Serous

secretions flow in varying severity from the eyes and nose. Examination of the nasal mucosa reveals severe hyperemia of the lining mucous membrane.

Frequently, symptoms progress no further. Acute attacks are followed either by complete recovery, become chronic, or terminate in death. Approximately 3% of affected animals died according to experience in Colorado. Mortality of morbid animals ranges from 5 to 10% in California. Incidence is variable. At times most become ill; on other farms or ranches only a few are affected.

Animals that progress to chronic illness suffer rapid weight loss, are inappetent, and develop dyspnea described as "noisy mouth breathing." Course is from 30 to 90, or 120 days. Affected heifers abort frequently. Outbreaks occur most often after animals have been on fattening rations for periods of 30 to 40 days.

Pathology

The disease is characterized as an inflammatory rhinitis that may extend, in severe cases, to the lungs.

Moribund animals exhibit encrusted muzzles, nasal and salivary discharge, oral breathing, and great loss of weight. Mucous membranes throughout the upper respiratory tract are swollen, severely congested, having scant to considerable deposits of loosely adhered, mucopurulent exudates. Histopathological study of sections reveal an intact membrane; ulcerations are minimal. If changes as described above attack only the anterior portions of the nasal cavity, recovery is favorable. When morbid changes extend to the posterior nares, frontal and palatine sinuses, pharynx, larynx, trachea, bronchi and with resulting pneumonic complications, prognosis is grave. Pneumonia probably is the most frequent, contributing cause of death. Changes in the posterior nares are similar in nature to those occurring in the anterior portions. Histopathologically, hyperemia and enlargement of vessels and infiltration of leukocytes predominate in tissue sections. Necrosis of vocal cords was mentioned when infection was advanced and had progressed to the larynx. Even in cases of mild tracheitis recovery is rather prompt. Severe tracheitis, with exudates loosely attached to lining and filling the organ, are fatal. In late cases necrosis and desquamation in the trachea are observed at autopsy. Bronchi filled with exudate and pneumonia complications usually are fatal.

Transmission Studies

Studies reported indicate that bacteria-free inocula caused symptoms identified as rhinotracheitis in susceptible animals.

Through inoculation of various materials, it was determined that spleen tissue collected at autopsy, and blood from febrile animals, as well as nasal and tracheal exudates, produced the disease. In early study, feces also were employed since it was believed that diarrhea was a pertinent symptom. Later diarrhea was found to be inconstant in the symptom complex.

Incubation period varied from three to six days under experimental conditions.

Solution of the problem of rhinotracheitis has received tremendous advance in the studies. An infectious agent has been obtained from naturally infected cattle and proved transmissible to susceptible cattle, from which the etiological agent (virus) has been recovered. Further work on rational of prevention and treatment may be expected in the near future.

LEPTOSPIROSIS IN SWINE

Notes from paper presented by L. C. Ferguson, D.V.M., Ph.D., E. H. Bohl, D.V.M., Ph.D., and T. E. Powers, D.V.M., M.S., Department of Veterinary Science, Ohio Agricultural Experiment Station, Wooster.

Leptospirosis in swine has become an important disease consideration as the cause of abortion and neonatal mortality in this species. In addition, infected swine become renal carriers of *Leptospira pomona,* and serve as reservoirs of infection for other swine, cattle, horses, and man.

Serological evidence has established the disease as widespread throughout the swine belt. It has been found whenever and wherever it has been sought. Random blood samples collected at slaughtering establishments in different parts of the country have revealed incidence rates varying from 3 to 22%. Clinical recognition of the disease is difficult and many cases are undiagnosed. Symptoms frequently are so mild they are overlooked by growers. Careful observation in experimentally infected animals indicate that noticeable illness may be fleeting or exhibited as inappetence and constipation lasting for one or two days. Acute field outbreaks have been observed. One reported by the authors illustrates the serious nature of acute infection. Twenty-five sows aborted or farrowed 257 pigs of which 161

were stillborn and 17 weak pigs died shortly after birth for a death loss of 70% of the entire pig crop. In spite of such isolated, extreme case histories, far more economic loss is attributed in herds in which there are no well defined abortions, but litters are farrowed containing some dead and unthrifty animals which die within the first week of life.

The large problem in control of leptospirosis in swine revolves around the prevention of the carrier state or eradication of carrier animals. Three approaches to this problem have been investigated: (1) Immunization, (2) mass treatment with antibiotics and other chemotherapeutic agents, and (3) introduction of only serologically negative animals into clean herds. Relative value of bacterin treatment has not been established. Streptomycin is the only agent reported to give promising results. Combinations of these may be expected to aid in reducing losses in infected swine herds and should reduce spread of disease.

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EPIZOOTIOLOGY OF VESICULAR EXANTHEMA IN CALIFORNIA

Abstract of address presented by R. A. Bankowski, D.V.M., M.S., Ph.D., A. G. Perkins, B.S., D.V.M., E. E. Stuart, B.S., and Mary Kummer, B.A.

The sudden, explosive nature of vesicular exanthema of swine during the 1952 enzootic, and the history of its incidence in California for the previous 20 years, has revealed this disease to be unpredictable, inevitable, and versatile. It should be classed among the most highly infectious contagious diseases of domesticated animals.

This report, summarizing extensive research, reveals some new facts that add to an understanding of the nature of the etiological agent and the disease it produces. These studies will facilitate formulation of successful programs for prevention and control, and for these reasons are of especial value to regulatory veterinarians and practitioners.

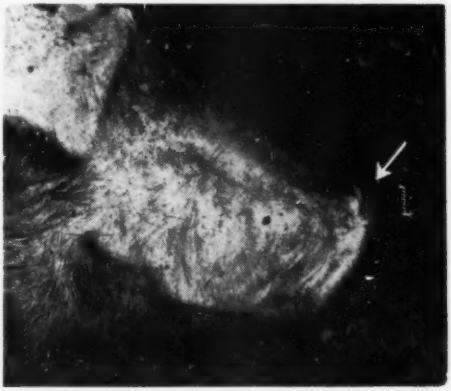
In 1937, Crawford, working at the Beltsville station reported recognition of four immunologically distinct types of virus of vesicular exanthema. More recently Brooksby demonstrated existence of at least five types, all having individual character. A relatively simple and inexpensive complement-fixation technic has made possible identification of serological types. In the laboratories under Doctor Bankowski's supervision, 325 samples of virus material have been typed. Of these, 126 were from native herds and 199 from hogs imported into California during the 1952 enzootic. All of the latter, without exception, tested serologically or by cross-immunization tests, were indistinguishable from type B_{51}. Samples from native herds typed B, C, D, and E, in 38, 24, 20, and six instances respectively. No serological type A, identified in 1948, has been found during the course of these studies.

Dr. R. A. Bankowski

Vesicular exanthema. Note vesicules (circled) near the posterior cleft margin. Lesions on the coronary band are covered with a blackened crust. Vesiculation, rupture, and scab formation progress in rapid succession.

The significance of these results, substantiated by other work, is that only type B virus escaped from California. Certainly no other type has been known to return to the state and, where typing was done on infected swine outside the state, type B was revealed as the infectious agent. Considering this and the additional fact that other types which are infective, at present exist in California, a disease potential of great proportion is revealed. Theoretically, a single swine herd could conceivably suffer five successive attacks of vesicular exanthema, none of which would be expected to protect against another.

Doctor Bankowski cited experience in one herd where a second or third outbreak followed closely a first and second; lesions actually appearing on the scars of previous ones, caused by a separate type of virus agent. These recurrent infections confused the disease picture until these variables were understood and the pattern of infection shown. Additions of susceptible swine to the lot also confused the disease picture. There also can be no question but that hogs incubating the disease were received in California from various points and developed lesions on ranches where acceptable garbage cooking practices prevailed.



Snout blister just posterior to the chisel. Covering is thick and opaque; all skin layers are raised.

Subclinical Infections

As more information and improved diagnostic procedures have been established, inapparent or subclinical infections have been proved to exist as in other infectious diseases. It was considered important to determine if subclinical vesicular exanthema infection occurs, which fact was demonstrated by resistance to challenge to homologous virus by pigs which had not undergone visual or apparent illness. A marked variation in severity and morbidity rates in outbreaks has been observed in the field with each of the prevalent types of virus. No direct correlation has been evident between severity and morbidity rates.

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TRANSMISSION OF VESICULAR STOMATITIS IN SWINE

Notes of paper presented by W. C. Patterson, V.M.D., E. W. Jenney, D.V.M., and A. A. Holbrook, D.V.M., Beltsville, Maryland.

Vesicular diseases of domestic livestock (hogs and cattle) are of prime importance because of their similarity to foot-and-mouth disease. Studies continuing on all three of these are revealing the nature of each and demonstrating variables that are differentiating.

Experiments reported by the authors were designed to demonstrate factors related to transmission of vesicular stomatitis in swine. In these it was shown that the virus can be spread quite easily by direct contact for only about five days (132 hours). In this respect it is similar to vesicular exanthema but, unlike the latter, gains entrance through skin abrasions; contrary to vesicular exanthema experiments where ingestion appeared to be the common route of virus entry.

Vesicular stomatitis, however, can be transmitted by feeding meat scraps from artificially infected animals, though not with the ease with which vesicular exanthema can be spread. Tissues were infective for about six days (144 hours) after vesiculation of donor pigs. Saliva collected from reacting pigs prior to the development of vesicles also was shown to contain active virus, while feces and urine collected at the same time did not prove infective.

Vesicular stomatitis in swine; showing blanching at the coronary band in both a front and a hind foot. Vesicles are forming beneath these blanched areas. Note involved lateral dew-claw.

NATION-WIDE ERADICATION OF HOG CHOLERA

Report presented by S. H. McNutt, D.V.M., Madison, Wisconsin, chairman.

This Committee stated flatly that there is now accumulated evidence, having sufficient support, that hog cholera can be eradicated from the United States. It did not forecast a completion date. It reaffirmed previous reports. The work and forward thinking of members assigned to this committee during the past years and interested non-committee members of the U.S. Livestock Sanitary Association working with them, is regarded as most commendable. Discussions have been exhaustive, subcommittee work meticulous, and rational recommendations and plans have furnished a foundation on which any required measures necessary for eradication are possible.

The pilot test area will be continued in Florida under the plan already operative and receiving support of growers. Vaccination is practiced in this area largely with use of the new modified virus vaccines and antiserum. Consideration has been given to establishment of a non-vaccination area but for the present must be abandoned. This is the next and logical trial step which will require careful supervision.

The Committee submitted statistical material regarding production and sale of hog cholera biological products. In this was shown that hog cholera antiserum produced in 1955 approximated that produced during the previous two years but was one-half of that produced in 1951. Production of simultaneous virus was also reduced; approximately 17,000,000 doses were produced in 1955 as compared to 54,000,000 in 1951. An estimated 29,000,000 doses of modified live virus vaccine will be sold in 1955 — a 33% increase over the previous calendar year.

Emphasis was given in the Committee report to the importance of disease control efforts in maintaining manpower and facilities to assure proper cooking of garbage prior to feeding swine. Some efforts have been made to lessen restrictions of these procedures because of eradication of vesicular exanthema from state areas. Incidence of hog cholera appears to be decreasing steadily, due essentially to: (1) Cooking garbage, (2) vaccinating large numbers of swine, and (3) decreased use of virus for immunization. In reference to vaccination, the Committee pointed out that vaccination of 70% of all susceptible animals is sufficient to prevent any large epizootic of many diseases, including hog cholera. Only about 50% of susceptible swine are now vaccinated.

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SWINE BRUCELLOSIS

Report by R. W. Carter, D.V.M., Columbia, South Carolina, chairman.

It was disclosed at the 1954 meeting of the U. S. Livestock Sanitary Association that 13 states had instituted control programs for swine brucellosis. Since that time, seven additional states have in operation a testing and certification plan on the order of that submitted earlier. (See Proc. 58th Ann. Mtg. U.S.L.S.A., p .204 — Abs. *Vet. Med.* 50:17 [Jan.], 1955).

The Committee expressed concern because of lack of interest of the swine industry gen-

Method of restraint and approximate location of ear vein for bleeding swine for the standard serum agglutination test.

erally, expected to be stimulated by the accelerated bovine brucellosis campaign. In spite of agreement that swine brucellosis must be reckoned with before the disease either can be controlled effectively or eradicated among cattle, swine growers are not taking advantage of the opportunities presented.

It was recommended that information concerning Brucella infection and its influence on swine breeding health be made available to the industry and that practitioners perfect bleeding technics so that the costs for testing equal those now prevalent for cattle.

It was the consensus of this Committee that further research is needed, but because of the multiplicity of problems in swine diseases it is questionable whether it can be given priority until information now available and recommendations so far made have been put to maximum use. Yardsticks proved practical for bovine brucellosis can not be applied directly to reduction of this disease in swine. Varying aspects make necessary modifications that fit the situation in this species. Matters pertaining to herd history, flexible interpretation and repeated negative seroagglutination tests, et cetera, were mentioned to assure that growers have an adequate supply and a dependable source of clean stock for replacement.

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THE DERRINGUE PROBLEM IN MEXICO

Abstract of paper presented by Dr. F. Camargo, General Director, Office of Livestock Research, Palo Alto, Mexico City, Mexico.

Derringue, as vampire bat rabies is called in Mexico, has been recognized as a serious disease of cattle in Mexico since 1923. It occurs in cycles of elevated incidence, particularly in the valleys between mountainous areas, in both eastern and western Mexico. It has been confirmed as occurring in 23 of the 32 states and territories of that country.

This disease is a paralytic form of rabies, although nervous manifestations are observed in affected cattle occasionally. Mortality is 100% of affected animals and morbidity, at times, reaches from 50 to 80% of the cattle in afflicted localities.

Two species of vampire bats normally feed on cattle and other livestock. The common vampire bat, *Desmodus rotundus* and the hairy-legged bat, *Diphylla ecandata*, are classed as hematophagous, which take a nightly meal between nine and ten o'clock, scarcely disturbing their prey while feeding. A bat laps approximately 1 oz. of blood that flows from the small wound made in the skin with its teeth. Generally a bat feeds on the same animal, often in the previous wound, which gives double exposure by bite and the lapping tongue. Vampire bats transmit rabies either at the height of an epizootic outbreak in the bat colony or as apparently normal carriers.

No means have been found to destroy or reduce bat populations because of their number and the widely separated and hidden recesses they inhabit. Immunization of cattle, therefore, appears as the only practical approach to disease control.

In 1950, 2,000 animals vaccinated intramuscularly in the thigh with 5 ml. of 33% suspension of infected chicken embryo vaccine, proved the product to be innocuous for cattle and conferred a reliable degree of immunity. In 1952, 500,000 head were vaccinated free of charge in a pilot program to develop the best procedures for mass vaccination. In 1953, the number of vaccinated cattle was increased to 800,000 which proved to be protected in contrast to mortality observed among non-vaccinated animals in neighboring areas. Later the same year, serial passages of the virus led to the discovery of a new strain having desirable properties of lowered pathogenicity and retained antigenicity.

In both 1954 and 1955, 800,000 doses were prepared and have been applied with success. In the State of Jalisco, over 300,000 head were vaccinated, with mortality rate reduced from 56 to 4% in 1954, and to 0.7% in 1955. A self-supporting plan is now in effect with cooperation of private veterinarians and livestock owners.

Field observations appear to indicate that vaccinated animals are being protected with a single injection for more than two years. Advantage is being taken of this observation to extend immunization procedures to the non-vaccinated. In the last 3½ years some 2,300,000 animals have received the prophylactic dose. It is estimated that an additional 700,000 must be treated in the affected areas to prevent losses from localized outbreaks.

The speaker expressed the opinion that the disease does not at present appear to threaten American livestock. The natural history of vampire bats indicates that their geographical range is limited by favorable climatic conditions not present north of the Rio Grande. Presence of rabies in fructivorous and insectivorous bats have been reported as rare, in

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sporadic cases only, and are not considered to pose a problem of epizootic proportions or prove a menace to the livestock of the Southwest.

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CHRONIC REPIRATORY DISEASE OF POULTRY

Abstract of paper by O. L. Osteen, D.V.M., Animal Disease and Parasite Research Branch, A. R. S., USDA, Beltsville, Maryland.

It is conservatively estimated that losses to the poultry industry in this country now run $25,000,000. annually because of mortality, culls, prolonged feeding time, and faulty carcasses of inferior quality as a direct result of chronic respiratory disease.

Much valuable knowledge concerning this disease has been accumulated during recent years, yet unanswered questions concerning vital aspects continue to confuse. Chronic respiratory disease is caused primarily by pleuropneumonia-like organisms (PPLO). This is reasonably well established. Primary method of dissemination is from infected breeders through the egg to the offspring.

In reference to treatment of infected flocks, the author stated that, ". . . it is not possible at the present time to say that any of the materials used in the manner recommended has a specific effect on chronic respiratory disease infection where the work has been done experimentally under rigidly controlled conditions." Conflicting field reports also make difficult to decide whether the added costs to producers for antibiotics are economical. As a matter of record, Doctor Osteen quoted reports of well-qualified authorities who question antibiotic feeding to poultry at either low or high therapeutic levels. Primary purpose of antibiotic feeding is directed at secondary infections and not the causative agents that plague the industry. Furthermore, supplementing feeds with antibiotic agents has been shown to effect undesirable changes in addition to matters related to the health of consumers of poultry. Questions are being asked about influence of popular feeding programs not only on disease and resistance but on the development of diseases.

Has the feeding of antibiotics influenced the increase in importance of pleuropnemonia-like infectious arthritis, or hemorrhagic syndrome? There has been no report on the long time physiological effects of antibiotic feeding and the net result on the chemistry of these birds' carcasses.

Disease stress factors are known to precipitate latent, chronic respiratory disease. Extremes of temperature and poor management will do the same. Significance of many of these things remains to be determined. Control procedures await results of concerted effort toward a more complete understanding of this serious disease of poultry.

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The Indiana Swine Health Council, sponsored by the Indiana Swine Breeders Association, the oldest swine breeders organization in America, is a most significant development for control of swine diseases. Acceptance by breeders and producers cooperating in the plan is commendable, and may be expected to accomplish its purpose of providing a source of clean breeding stock.

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Mucosal diseases (mucosal disease, rhinotracheitis, upper respiratory disease, red nose) have been reported from 22 states. Factors in regard to their cause, pathology, and serology are complex and confusing. Much experimental work is being directed toward clarifying these and other matters of concern regarding this group of conditions having striking similarities of symptoms.

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A poll of livestock sanitary officials revealed that 30 held the opinion that the use of simultaneous hog cholera virus, as an immunizing agent, should be outlawed by legislation.

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Dr. H. S. Cameron, Davis, California, outlined details of extensive research that indicated the serologic whey test as equal to the blood test in the diagnosis of brucellosis of the udder.

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Estimated valuation of American livestock is placed at $12,000,000,000. according to Dr. F. J. Mulhern. Number of animals on farms and ranches was given as follows:—

Cattle	75,000,000
Hogs	101,000,000
Sheep	31,000,000
Horses	3,000,000
Mules	1,500,000
Chickens	427,000,000

Report Of Committees

BOVINE ANAPLASMOSIS

Report by L. J. Poelma, D.V.M., M.S., College Park, Maryland, chairman.

QUESTIONNAIRE has revealed that the incidence of anaplasmosis has remained unchanged during the past year. Seventeen states reported the disease to be a major livestock problem, that incidence was highest during the period June to September, and that vectors (flies, ticks, mosquitoes) were responsible, primarily, for spread of the infection.

The Agricultural Research Service has devoted considerable effort to the problem. Complement-fixation tests have been applied to 164 herds of cattle in 12 states comprising 10,172 cattle. Reactors in heavily infected herds reached 90%, other herds revealed less than 1% infection. A study of results has made clear that it would be impractical to attempt a test and slaughter program, particularly in areas where insect vectors abound during all seasons.

The Committee endorsed the complement-fixation test for anaplasmosis in the hands of qualified laboratory workers. It could be used as an effective tool for eradication of the disease. It recommended; (1) that there be developed an official test to assure uniformity of results, (2) that incidence surveys be continued, and (3) that field trial control and eradication programs be developed as pilot studies.

Dr. M. R. Clarkson, deputy administrator for regulatory programs, advised that the Agricultural Research Service is prepared to supply antigen for survey testing in large amounts.

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PUBLIC HEALTH

Report presented by W. L. Bendix, D.V.M., Richmond, Virginia, chairman.

The U. S. Public Health Service, through concern of the situation pertaining to the inspection of poultry for wholesomeness, working with the poultry industry, has prepared a model ordinance for adoption on state or municipal levels, which deals with sanitation of poultry processing plants and inspection of carcasses. This recommended ordinance has been approved and is ready for adoption and enforcement. This Committee gave unqualified endorsement and approval and expressed a fervent hope for universal adoption.

Amendment to the Meat Inspection Act of 1906 was recommended for the interstate problem of poultry inspection. The Committee pointed out that the Act of 1906 was amended July 24, 1919 to include inspection of horse meat and that it is high time (35 years since previous amendment) that this Act be amended further to include poultry meat.

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REGULATORY EDUCATION

Summary of report by F. R. Hay, D.V.M., chief, Division of Animal Industry, Columbus, Ohio, committee member.

The appointment of this special Committee implies that there exists a feeling among regulatory officials that specific, formal training is desirable and needed for those students planning a career in veterinary sanitary service.

A poll of state officials revealed the opinion held among them that a credit course in regulatory medicine should be required of senior students. In addition, they recommended on-the-job training, instructions regarding the proper handling of forms, reports, et cetera, greater participation of themselves and members of their staffs in regional, state, and national meetings, and finally more information in current veterinary literature that deals with procedures in disease control and prevention.

At present no school of veterinary medicine offers a special course devoted exclusively to regulatory matters though most discuss state and federal quarantine procedures and other pertinent matters in courses in special pathology, hygiene, infectious disease, and others. Schools everywhere apparently recognize the importance of this subject and invite regulatory officials as special lecturers. All schools have arranged for training in inspection procedures where federal inspection is maintained in close-by packing establishments.

Consensus of deans was that in such a rapidly expanding field as veterinary medicine, with its broad coverage in knowledge and fields of service, many demands exist for expanding student training along special lines. Time allotted for undergraduate training does

not allow for all of these. A thorough knowledge of the basic sciences must be depended upon to provide the foundation for all the various specialized services veterinarians are called upon to perform. Emphasis must, of course, also be placed on the application of these fundamental principles to assure a working knowledge.

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VESICULAR DISEASES

Abstract of report presented by F. J. Mulhern, D.V.M., Washington, D. C., chairman.

Remarkable progress has been made in enforcement of state laws and regulations recently applied to control of vesicular exanthema in swine. At present, 46 states have outlawed feeding of raw garbage by legislation. Inspection to assure enforcement is being perfected. The Committee warned of dangers of complacency in regard to this disease, pointing out experience in California when, after a period of 42 months of quiescence (1936-1939), explosive and widespread outbreaks took a significant toll.

Vesicular stomatitis in a cow. Note freshly ruptured vesicle at the site of a gingival inoculation.

Interest and cooperation of most feeders is encouraging, not only because of the influence of recommendations on vesicular exanthema, but because of the reduction of exposure to other diseases of swine. There is a favorable trend in New Jersey where legislation requiring cooking garbage has been defeated. Approximately 50% of the swine in that state receive the cooked product. Here, too, as well as in California, high standards have been developed for cooking to assure kill of all infectious material.

Vesicular stomatitis in a cow. Recently ruptured vesicle at site of inoculation on the tongue.

Vesicular stomatitis appears to be confined to the southern states and Texas. The Committee referred to study of the Wisconsin group indicating for the first time enzootic proportions of this disease in wild animals. Conclusions from field investigations indicate a higher incidence than reported on the basis of demonstration of significant antibody titers of vesicular stomatitis in animals reported to have recovered from necrotic and mycotic stomatitis. The Committee urged discretion in the use of terms identifying disease entities of this group and that practitioners be alerted to the problem of vesicular stomatitis in both cattle and swine.

In discussing progress made in research studies of virus, the Committee called attention to reports of the separation of tobacco mosaic virus into protein and nucleic acid components. Evidence has been presented indicating that both the infectious and antigenic properties of this plant disease virus, which behaves quite similarly to animal disease viruses, are contained in the protein fractions. This fraction is not disease-producing, however, except when combined with nucleic acid and a certain degree of restored pathogenicity has been obtained by bringing the previous separate proteins and nucleic acid portions together. Significance of these findings remains to be ascertained.

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No human cases of psittacosis are reported attributable to contact with turkeys during the present calendar year. Serious outbreaks occurred in 1954.

MORBIDITY AND MORTALITY

Report by J. R. Hay, D.V.M., Chief, Division of Animal Industry, Columbus, Ohio, chairman.

This Committee announced that it had in preparation initial draft of a reportable disease handbook and recommended that the work be continued for scheduled publication in 1956.

At the Atlantic City meeting of this organization (1953) this Committee presented a list of 32 diseases recommended to be adopted by the Association as reportable. After thorough examination, certain others have been added to the original list including: Bluetongue, bovine brucellosis, swine brucellosis, chronic respiratory disease, infectious bronchitis, swine influenza, laryngotracheitis, mucosal disease, Newcastle disease, Q fever, rhinotracheitis, scrapie, transmissible gastroenteritis, tuberculosis, and virus diarrhea.

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BRUCELLOSIS

Abstract of report presented by R. W. Smith, D.V.M., Concord, New Hampshire, chairman.

The Committee affirmed the report of the A.V.M.A. Committee on Brucellosis and reemphasized the important role of calfhood vaccination. It urged continuation and expansion of this phase of the program until the goal of eradication has been achieved in every state of the nation. It was also recommended that an active educational program be continued in all states for the enactment of appropriate legislation to assure high level activity and interest. The rational of this is unquestioned when experience during war years is recalled. Residual infection has potential danger and can scuttle plans for eradication if allowed to exist. The pressure must be continued without let-up to capitalize on gains so far attained.

Changes in Uniform Methods and Rules were recommended including: (1) To declare an entire area program operative when 75% or more of livestock owners holding a majority of cattle in a given area place their herds under any one of the control procedures outlined, (2) provide for the exclusion from the herd test official vaccinates under 30 months of age, and (3) in instances where herd certified status has been cancelled only because of the presence of an official vaccinate 30 months of age or older, disclosing reaction in dilution of 1:200 or higher, status to be restored after one clean herd retest applied not earlier than 60 days following removal of such reactor.

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QUESTIONS ABOUT MASTITIS NOT ANSWERED

Mastitis continues to be a major disease problem of the dairy industry. Widespread use of antibiotics, while apparently of value when properly employed in individual herds, has not reduced the overall incidence of the disease among dairy cattle.

The Committee on Infectious Diseases of Cattle listed, in their report, a number of questions for which qualified answers are needed and would be invaluable to prevention, control, and treatment of this costly disease. They are as follows:

1. What influence does the quantity and quality of feeds have on occurrence of mastitis?

2. What factors, other than trauma, increase the susceptibility of the bovine udder to infection?

3. Is a virus concerned in mastitis?

4. What is the habitat of various mastitis organisms in addition to the infected mammary gland?

5. Why do therapeutic agents, which appear to be effective against mastitis organisms in the test tube, sometimes fail when they are used in the udder?

6. Is it necessary for antibiotics to kill all mastitis organisms before complete sterilization of the quarter can be accomplished, or is inhibition sufficient?

7. Can immunizing agents assist in the control of any of the various mastitis organisms?

8. Does inflammation of the udder occur in the absence of demonstrable bacteria?

9. Is there antagonism between certain mastitis pathogens so that the presence of one will inhibit the successful invasion of another?

10. Are common mastitis organisms becoming resistant to the action of the antibiotics now commonly used?

11. Are strains of *Staph. aureus* found in bovine mastitis the same as those found in human infections? Do they form enterotoxins?

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For each pound of milk a cow produces, her heart pumps 400 pounds of blood through her udder.—*S.N.L., Nov. 19, 1955.*

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Equine Encephalomyelitis Transmissible to Man

The report of a survey of 614 inhabitants of Weld County, Colorado, indicates that 10.9% of the sampled population, all those tested inapparently infected, reacted to the presence of specific antibodies in their blood for the western strain of equine encephalomyelitis. Residents of the community for 15 to 24 years had higher rates than newcomers; in the 15- to 30-year group more males than females showed the higher rates, though in the group over 45 years of age the highest incidence was in females. To veterinarians this should indicate that infected horses should be kept in fly and mosquito proof enclosures, and carcasses, before final disposal, must be tarpaulin covered as the virus is in the blood for at least several hours following the animal's death. The use of insect repellents during an attack is recommended.

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Stilbestrol for Cattle

Up-to-date research appears to indicate that diethylstilbestrol, when used for the purpose of increased weight gains for fattening cattle, is to be preferred when added to the ration rather than by pellet implantation. Though there are economic gains by the implantation method, the side effects, not observed when added to the ration, such as restlessness, high tailheads and sagging backs, sex perversion evidenced by "riding", and mammary development, make implantation an undesirable method of administration. Administered orally in the feed up to 5 mg. daily for animals weighing approximately 400 to 600 lb. where they are started on feed, and as much as 10 mg. daily for weights of 600 lb. or more, has resulted in lowered feed requirement reducing feed cost by as much as 10%.

Another question frequently raised is the matter of residues in tissues when animals have been on a diethylstilbestrol ration. This may be answered by the fact, substantiated by chemical assays, that no detectable residues have been found by either chemical or serological testing.

Foot-and-Mouth Disease Vaccine by Tissue Culture

It has been announced by the new Foot-and-Mouth Disease Laboratory at Plum Island, New York, that instead of using living animals for virus propagation, a simplified method has been developed to grow virus by the tissue culture method using bovine kidney tissue. By this means vaccine can be prepared more quickly and economically.

▾ ▾ ▾

Incidence of Trichinosis in Man

Kimsey and Adams in the U.S. Public Health Service Reports for October 1955, have a statistically significant and informative article about *Trichinella spiralis* in the diaphragms of man and swine. The diaphragms of human beings consisted of parts obtained during routine autopsies at the Louisville, Kentucky General Hospital. The direct microscopic examination of 311 specimens demonstrated 11.2% incidence of trichinosis. A second series of examinations of 250 diaphragms by a combination of the direct microscopic method, and the digestion (Baermann method) indicated an incidence of 20.8% infection. In an examination of 1,000 swine diaphragms obtained in Louisville abattoirs there were found to be only two having trichina.

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A recent article was brought to our attention concerning the concentration of tetracycline antibiotics (chlorotetracycline, oxytetracycline, and tetracycline) in tissues, blood serum, and thyroid gland. It was observed in studies on human subjects that tissue and serum concentrations of each of the three parallel each other closely. The significant feature is that tetracycline gives a higher serum concentration than either of the other two. On the foregoing basis it is suggested that in the handling of microbial diseases, in which the etiological organisms are equally sensitive to all three of the antibiotics, tetracycline should be the agent of choice.

Small Animal SECTION

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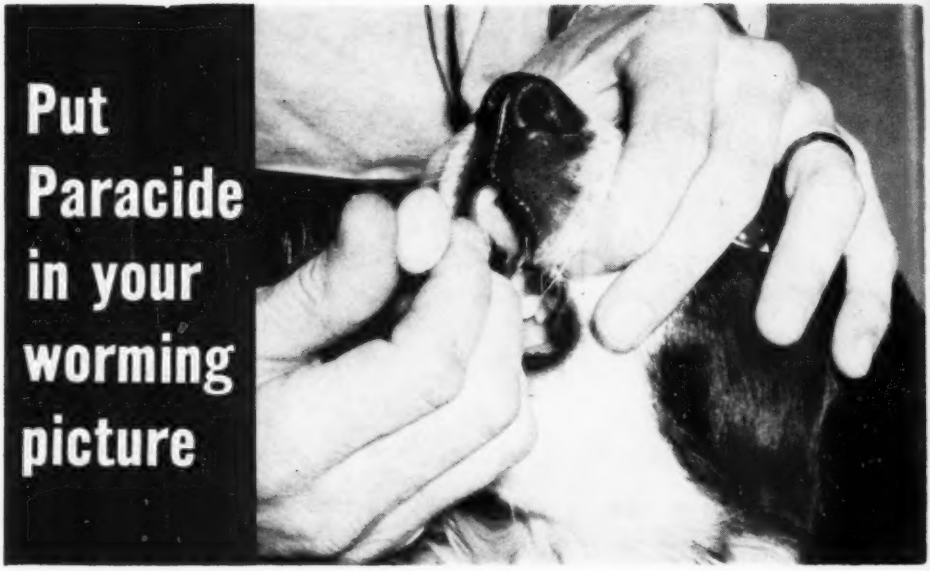

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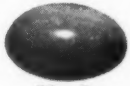
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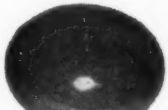
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Feline Infectious Anemia†

EARL J. SPLITTER, D.V.M., M.S., EDIN R. CASTRO, D.V.M., WENDELL L. KANAWYER, D.V.M., Manhattan, Kansas

THE occurrence of a transmissible anemia of cats recently has been reported by Flint and Moss[1]. Reproduction of the disease in susceptible cats was accomplished by intraperitoneal injections of citrated blood obtained from carrier cats or recovered cases. Erythrocytic bodies, described as anaplasma-like but of variable morphology, were found associated with the disease in all affected cases. These bodies were described by Weinman[3] as resembling organisms of the genera Haemobartonella or Eperythrozoon.

Previously Clark[2] had described an acute anemic condition occurring in a cat in South Africa. Blood forms identical to parasites of the genus Eperythrozoon were found associated with the disease. No experimental work was possible as only blood and spleen smears were available for diagnosis. Since the parasite had not previously been recorded from cats or other felines, Clark assumed the organism to be a new species, and gave it the name *Eperythrozoon felis.*

An investigation was undertaken by the authors to determine if an agent capable of producing anemia exists in cats in the Kansas area. Initially a splenectomized cat injected with blood from two young cats failed to develop any evidence of infection. A subsequent repetition of the experiment using pooled blood from adult cats obtained locally resulted in the recovery of an infectious agent apparently identical to that reported by Flint and Moss[1].

Procedure

Initial recovery of the agent producing feline infectious anemia was accomplished by the intraperitoneal injection of a young cat with citrated blood obtained from seven mature local cats. Additional sources of the infective agent were obtained from three local male cats each of which was found to a latent carrier. Infection in two cats was first detected after splenectomy by microscopic examination of the blood. In the third, microscopic blood examination alone revealed the animal to be a carrier.

At least one month prior to experimental inoculation all cats used in these studies were vaccinated with two injections of tissue vaccine for the prevention of feline infectious panleucopenia. The animals then were held in separate cages grouped in three isolated holding areas to prevent the occurrence and spread of panleucopenia or the accidental transmission of infectious anemia.

The age of experimental cats in which infectious anemia was reproduced varied from

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The participation of Doctor Castro in this study was made possible through a fellowship from the Rockefeller Foundation of New York. Doctor Castro is now at the Laboratorio Biologia Animal, Ministerio de Ganaderia y Agriculture, Montevideo, Uruguay.

Doctor Kanawyer, formerly assistant professor of Pathology, Kansas State College, is now a small animal practitioner, San Francisco, Calif.

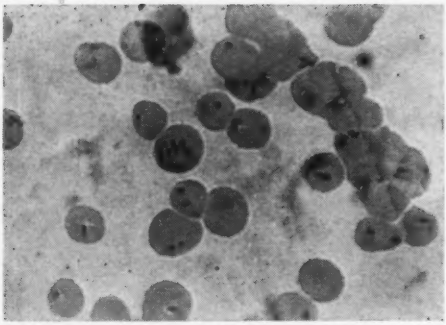

Fig. 1. Coccus and ring forms in the blood of a cat affected with infectious anemia.

three months to approximately two years. Transmission was accomplished by intraperitoneal injection of citrated blood (usually diluted in physiological saline) in amounts varying from 0.1 to 0.2 ml. Data gathered included body temperature, microscopic examination of blood smears, total erythrocyte and leukocyte counts, and hemoglobin determinations. Observations were made on alternate days throughout the course of the disease. All attempts to cultivate the etiologic agent on ordinary laboratory media were unsuccessful.

Pathogenesis and Symptoms

Following experimental inoculation of 28 susceptible cats Haemobartonella or Eperythrozoon-like bodies (described below) were detected on the erythrocytes in Giemsa-stained blood smears. The organisms appeared in an average of seven days after injection of blood, the minimum period for their detection being three days and the maximum 20. There occurred then a series of parasitic attacks characterized by an increasing frequency of parasites over a period of several days followed by a spontaneous decrease in the number of organisms often to a point in which blood smears became negative. After an irregular time, usually from two to four days or more, a recidivation took place. Three or more relapses, often of increasing intensity, were usually observed before acute anemia developed. These multiple attacks occurred over an average total period of 28 days. Blood values usually decreased most rapidly during and immediately following parasitic relapses, and sometimes increased slightly until the next parasitic blood invasion.

The majority of cats inoculated developed subclinical symptoms only, and remained active throughout the course of the disease despite erythrocyte counts which in most cases reduced to lows between 3,000,000 and 4,000,000 cells per cu. mm. (table 1). A marked loss of weight and slight anorexia sometimes were associated with subclinical cases. In a number of instances a chronic anemia persisted over a period of one to two months, and was associated with fluctuating numbers of blood parasites.

Marked clinical symptoms of cachexia, extreme weakness, and anorexia were observed two or three days before death in those animals that succumbed. Red cell counts reduced to lows of 1,500,000 to 2,000,000 per cu. mm. (tables 1, 2). In both clinical and subclinical cases, temperatures usually remained normal, although elevations to 104.5 F. often occurred at the peak of parasitic attacks. Subnormal temperatures of 97 to 100 F. often

TABLE 1. Hematological Data of Cats Experimentally Infected with Infectious Anemia

Parasitic attacks	RBC* Pre-inf. RBC 10^6/cu. mm.	RBC* 10^6/cu. mm.	RBC* Post-inocul. days	WBC** Pre-inf. WBC 10^3/cu. mm.	WBC** 10^3/cu. mm.	WBC** Post-inocul. days	Death Symptoms Days post-inoculation	
Data of 12 acutely affected cases								
Average 3.2	8.25	1.88	32.5	9.3	24.8	28	30	33
Range 1 - 4	6.44 - 9.50	1.10 - 3.55	19 - 52	6.5 - 12.5	11.2 - 53.8	18 - 45	16 - 48	19 - 52
Data of 16 subclinical cases								
Average 2.5	7.40	3.76	28.4	9.0	19.0	21.8		
Range 1 - 4	6.47 - 9.05	2.71 - 5.85	9 - 59	6.4 - 12.5	6.6 - 48.5	8 - 40		

*Lowest count **Highest count

were observed before death. Death occurred on an average of 33 days following experimental inoculation, the minimum period of time being 19 days and the maximum 52.

As noted by Flint and Moss[1] splenectomy did not increase appreciably the susceptibility to the disease as might be expected in Haemobartonella or Eperythrozoon infections. Parasitic relapses occurred in six known carriers which were splenectomized, but in most cases these recidivations and the resulting anemia were comparatively mild.

Parasite Morphology

In Giemsa-stained blood smears organisms were situated extracellularly on the erythrocytes with two basic morphological forms being presented. The predominating structure consisted of ring and coccus forms characteristic of Eperythrozoon (figs. 1, 2). Less frequently there could be observed deep staining rods typical of Haemobartonella (fig. 2).

The coccus and ring-shaped parasites averaged about 0.8 microns in diameter, with some forms as large as 1.5 to 2.0 microns. The rings were rather thick-bodied in appearance, and in this respect similar to forms of *Eperythrozoon suis*[8]. At the height of infection five or more parasites were found on individual erythrocytes with the majority of red cells infected. Irregular arrangement of the organism on the erythrocytes was characteristic; however, there could be seen groups of three to six organisms arranged in chains (fig. 3). This position suggested their development from the Haemobartonella-like rod forms.

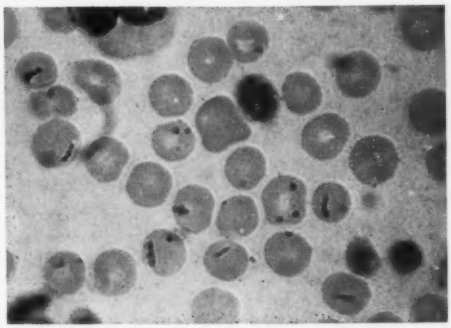

Fig. 2. Haemobartonella-like rods and coccus forms on the erythrocytes.

Rod structures of the parasite were usually present in all positive blood smears, and occurred commonly in pairs, but single forms or chains of rods arranged end to end were also present. Average length of the rods varied from one to three microns, and width averaged 0.5 micron or less. A division of the rods into two to six segments sometimes could be noted. This was followed by swelling and growth of the segments into coccus and ring forms identical to those that predominated. This apparent process of multiplication suggested that all of the structures present were

TABLE 2. The Course of Acute Anemia in an Experimentally Inoculated Cat

Days elapsed	Temp. °F.	RBC 10^6/cu. mm.	WBC 10^3/cu. mm.	gm. Hb. /100 cc.	Relative frequency of blood parasites	Remarks
0	101.5	7.15	10.5	11.5	negative	Injected with carrier blood.
4	102.4	7.20	13.1	11.2	scarce	
6	102.3	6.45	15.5	10.8	negative	
8	101.6	6.50	14.2	10.2	rare	
11	102.8	6.62	10.8	10.6	negative	
13	101.6	6.90	9.2	10.1	rare	
15	103.0	5.33	15.6	8.6	frequent	
17	102.2	4.95	12.2	7.2	occasional	Cat appeared normal, but was undergoing some weight loss. Regenerative blood changes.
19	102.1	4.32	10.1	6.5	scarce	"
22	104.3	4.00	14.2	6.1	numerous	"
24	103.8	3.70	12.0	6.0	frequent	"
26	102.8	3.52	9.5	5.6	occasional	"
28	103.2	3.10	12.2	5.2	occasional	"
30	104.4	2.57	19.4	4.5	frequent	Anemic mucous membranes. Marked regenerative blood changes.
32	103.0	2.32	21.9	4.1	numerous	Anorexia.
33	100.0	1.50	22.0	3.5	occasional	Cat was very weak.
34	Dead					

derived from the Haemobartonella-like rods, and that the condition is a haemobartonellosis rather than an Eperythrozoon infection.

Pathology

Grossly, the autopsy findings of ten cats that died of experimental infectious anemia were typical of an acute hemolytic anemia. Lesions included a passive congestion of the liver which appeared to be a constant finding associated with the acute anemia. In addition about one-half of the animals displayed a slight to moderate, generalized icterus. About the same number revealed splenic changes varying from a slight splenomegaly to a large friable, purple-black organ two or three times normal size (fig. 4).

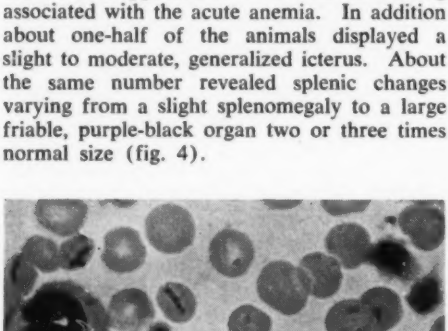

Fig. 3. Coccus forms and chains of coccus and rods on the erythrocytes.

Microscopically, the liver exhibited evidence of passive congestion with varying degrees of degeneration and necrosis of the hepatic cords around the central vein and progressing outward. Lymphocytic infiltration of the portal canal was present in some cases. Enlarged spleens showed a marked passive congestion, a moderate nodular hyperplasia, and considerable amounts of hemosiderin.

Transmission and Filtration Studies

To determine the possible presence of an ultramicroscopic agent associated with feline infectious anemia, a series of experiments was conducted using urine and blood serum filtrates as a possible source of infectious material.

Blood for filtration was obtained by heart bleeding of donor cats, and was centrifuged for 20 minutes at 2,000 r.p.m. to separate serum from the clot. Filtration was carried out with materials at room temperature under a constant vacuum of 100 mm. mercury negative pressure. Serum obtained from acute cases and carriers of infectious anemia was passed through Seitz EK, or 8- and 12-pound Mandler filters. Kittens, three to six months of age, were inoculated intraperitoneally with 1 to 7 ml. of the serum filtrates. These kittens remained normal with the blood being negative for parasites from 120 to 225 days. Each then was found to be susceptible to infectious anemia following inoculation with infective blood.

Urine was obtained from two cats in the acute stages of infectious anemia. Two susceptible cats were inoculated intraperitoneally with urine, one receiving 5 ml. and the other 1 ml. Both cats remained normal with negative blood smears for 160 days after which each was proved susceptible to the disease by inoculation of blood from affected animals. Further evidence of the absence of the infectious agent from body excretions was obtained in an experiment involving prolonged, close contact. Three cats were confined in a pen with two carriers for a period of 170 days. Transmission had failed to occur by the end of this time. The cats then were proved susceptible to infectious anemia by injections with blood from the carriers.

Infectivity for Animals Other than Cats

A study was made to determine the possible relation of infectious anemia to similar blood parasitic conditions of local animals. Rats, mice, swine, cattle, sheep, and dogs were splenectomized and observed for 30 days to establish the absence of latent blood infections. Inoculations with infective cat blood then were made intravenously or intraperitoneally into two or more splenectomized animals of each species.

None of the animals developed microscopic blood infection or evidence of disease following the injections of cat blood. At the end of a 60-day period of observation each animal was proved susceptible to blood parasite infection. By this method the cat parasite was differentiated from the following blood organisms: *Haemobartonella muris* of rats; *Eperythrozoon coccoides of* mice; *Eperythrozoon suis* and *Eperythrozoon parvum* of swine; *Anaplasma marginale, Eperythrozoon wenyonii,* and *Haemobartonella bovis* of cattle; *Anaplasma ovis* and *Eperythrozoon ovis* of sheep, and *Haemobartonella canis* of the dog.

Discussion

The evidence obtained thus far has indicated that the etiologic agent of feline infectious anemia is the blood parasite found associated with the disease, and that this parasite is probably a member of the genus Haemobartonella. The innocuous nature of body excretions and blood serum filtrates seems to exclude the possibility of a pathogenic virus associated with the disease. In this connection, however, the work of Gledhill *et al.*[4] and Niven *et al.*[5] is of interest. An experimental condition of mice termed "mouse hepatitis" was found to be produced by simultaneous infection with two filterable agents, both of which are relatively innocous alone. One of the agents was subsequently identified as *Eperythrozoon coccoides*. If a comparable situation occurs in feline infectious anemia, the two agents co-exist in the blood of naturally infected cats, for all strains recovered have been pathogenic.

The evidence obtained has indicated that the agent of infectious anemia is of comparatively common occurrence in the local cat population. This fact, together with the rather high experimental mortality observed, would suggest that the disease might be encountered quite frequently. Thus far, however, only one naturally infected acute case has been diagnosed locally, and therefore the incidence of the disease as it occurs under natural conditions remains to be determined.

Diagnosis of naturally occurring acute cases presents difficulties because of the rapid fluctuation in the number of parasites. Blood smears may be negative or sparsely infected during the most acute stages of the disease. The symptoms of weight loss and anemia predominating in less severely affected cases might readily be mistaken for intestinal parasitism. During these studies the complement-fixation test was investigated as a possible aid to diagnosis. A procedure of antigen preparation was followed which had been found to give strong, positive reactions with sera from experimental pigs recently infected with *Eperythrozoon suis*[6]. Thus far, however, reactions have been negative with cat blood antigens and blood antigens containing *Anaplasma marginale, Eperythrozoon suis,* and *Haemobartonella muris.*

It seems probable that the source of natural infection is the carrier cat. During these studies an experimentally infected cat was found to be harboring infective blood for a period of 15 months, and the blood of others was consistently virulent at the end of six to eight months. A latent carrier state is characteristic in animals following infection with blood parasites of the group involved[7]. The methods of natural transmission of infectious anemia have

Fig. 4. Autopsy of a cat dead from feline infectious anemia demonstrating splenomegaly.

not been determined. From the information available concerning transmission of Haemobartonella and Eperythrozoon, it would appear that biting arthropods probably serve as vectors of the disease. Fleas and lice have been incriminated as vectors of a number of parasites in these two genera[7,8].

The susceptibility of Haemobartonella and Eperythrozoon to the broad spectrum antibiotics[9,10,11,12] indicates the probable efficacy of these drugs in treating cases of infectious anemia. In a preliminary test of the activity of tetracycline hydrochloride in infectious anemia, four cats were given a single injection, intramuscularly, at the rate of 5 mg. per lb. body weight. The injections were given during the period of heavy parasitic blood infections. A marked reduction in numbers of parasites occurred in all cases within six hours, and the blood was microscopically negative in less than 24 hours. Blood smears remained negative and erythrocyte values increased over a period of about seven days subsequent to therapy. Relapses then occurred, and one of these terminated fatally. These results suggest that multiple dosage with tetracycline hydrochloride may be an effective form of treatment.

Summary

An infectious agent, probably identical to that reported by Flint and Moss[1], was recovered from the blood of local, apparently normal adult cats. Under experimental conditions variable degrees of anemia were produced in susceptible cats. In the majority of those studied, a subclinical type of infection developed which was characterized by an anemia varying from mild to severe. In one-fourth of the subclinical cases, a chronic state of anemia persisted for one to two months before blood values returned to normal. A leucocytosis and a loss in weight usually were associated with the development of anemia. Temperatures were elevated irregularly, with increases to 104.5 F. associated with heavy blood infections. Acute symptoms of anorexia and extreme weakness developed a few days prior to death. Death occurred on an average of 33 days subsequent to experimental inoculation.

In all cases the disease developed during and following a series of attacks from a blood parasite probably belonging to the genus Haemobartonella. A mortality of 35% occurred in 28 cases studied. Autopsy lesions included anemia and passive congestion of the liver. Splenomegaly and icterus occurred irregularly.

No evidence of an associated viral infection was obtained, and it seems probable that the blood parasite associated with the condition is the etiologic agent. Transmission was not accomplished in animals other than cats. Favorable results were obtained in limited experimental treatment with tetracycline hydrochloride.

The incidence of the acute disease as it occurs naturally is unknown; however, carriers of the infection are apparently quite common in the local adult cat population.

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Blackleg Prophylaxis for Sheep

Since the time is now approaching that Fallborn lambs will soon be reaching the blackleg and/or the malignant edema age (six months to two years is the most susceptible period) it is well to recommend that, in blackleg areas at least, vaccination with a combined *Cl. chauvei* and *Cl. septicum* bacterin. Two injections are recommended — the second 14 days after the first.

Trichomonas spp. in Feline: A Case Report

HELEN ELAINE JORDAN,* B.A., D.V.M., M.S.
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Little information is available in veterinary literature with reference to Trichomonas spp. as a causative agent of chronic diarrhea in cats. Kessel[1] describes natural infections in kittens, accompanied by gradual emaciation, with death occurring in five to ten days. Simic[2], using kittens as experimental animals for studies with human intestinal trichomonas, reported three natural infections from 68 cats examined. Brumpt[3] reported spontaneous infection of intestinal trichomonads. All three investigators successfully transmitted the infection. Hegner[4] reports an absence of pathogenicity in cats infected with Trichomonas spp. Hayes[5] also states that Trichomonas spp. can cause death in chinchillas showing no apparent lesions.

As a possible etiological agent of unexplained diarrhea[6] in cats, this case report is presented.

Clinical Case

A three-year-old cat was admitted to the clinic with a history of chronic lethargy, anorexia, and loss of weight. Shortly after admission a yellowish, mucoid diarrhea was observed. At this time Ancylostoma spp. and Trichomonas spp. were identified by fecal examination.

For four consecutive days before treatment, trichomonads were demonstrated by fecal examination. Methybenzene (450 mg.) was administered *per os* for the treatment of the hookworm infection, after which therapy for the protozoan flagellates consisted of a 100 ml. enema of 0.5% carbarsone® made up in a 2.5% sodium bicarbonate solution and given at 12-hour intervals for seven treatments[7]. Since the hookworm ova were still present after treatment for intestinal trichomoniasis, hexylresorcinol (0.4 gm.) was given *per os*. At no time following initial carbarsone therapy were trichomonads demonstrated. On the third day of treatment feces became normal in consistency and appearance, and the patient regained its appetite.

Two days following completion of the enema series, a bloody diarrhea, anorexia, and severe depression occurred. Although fecal examination was negative for either helminth ova or protozoan parasites, the severity of the condition increased from incoordination and muscular spasms to coma and paralysis. Death occurred the second day after the onset of hemorrhagic diarrhea. At necropsy the mesenteric lymph nodes were found to be greatly enlarged. Histological studies revealed marked depletion of the germinal centers, swelling of the sinus spaces, and induration. There also was evidence of an acute hepatitis with degeneration of the hepatic cells. Histopathological studies of kidney tissues revealed a degeneration of the proximal convoluted tubules, accompanied by edema and congestion. Superficial degeneration of the epithelial lining of the intestine was apparent; however, trichomonads or hookworms were not found. Postmortem observations indicated that the latter syndrome was an acute systemic disease rather than parasitism[8].

Experimental

In an effort to transmit the flagellates from the clinical case to a susceptible host, three non-infected kittens (age 16 wk.) were used. Each animal received 0.5 ml. of feces (*per os*) containing motile trichomonads. Feces from the subjects were examined at three day intervals for protozoan organisms.

Eight days postinoculation, one of the experimental animals developed clinical signs resembling the second entity of the patients, death occured 24 hours later. Before death the total leukocyte count was 3,500 per cu. mm. and the postmortem lesions were identical to those of the clinical case. Protozoan flagellates were not demonstrated from the dead animal.

Examination of feces from the two remaining animals failed to demonstrate trichomonads. The subjects were sacrificed 32 days after inoculation and Trichomonas spp. were not found in the alimentary canal.

Summary

An adult cat showing clinical signs of emaciation and diarrhea was found to be harboring Trichomonas spp. The flagellates persisted for four days prior to the initiation of car-

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For constructive criticisms and advice the author gratefully acknowledges Drs. Dennis Sikes and Frank A. Hayes, Department of Pathology and Parasitology, School of Veterinary Medicine, University of Georgia, Athens.

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barsone therapy and after the first treatment the organisms were no longer seen. The patient was treated also for a hookworm infection and seemed to be improving when it became acutely ill and died from what apparently was an acute systemic disease.

Using feces from the clinical case, an attempt was made to infect three kittens with the protozoan parasites. Although one subject succumbed to the panleucopenia complex[8] 32 days after inoculation, postmortem examination failed to reveal trichomonads from the remaining experimental animals.

In view of the fact that the case of intestinal trichomoniasis was complicated by the presence of two additional entities, the final significance of this brief study is left for the reader's evaluation. It seems evident that considerable work is needed on the possible relationship of the intestinal parasites to various bacterial and viral diseases.

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First successful transplant of human kidney has continued satisfactory, functioning for more than nine months. Surgeons of the Harvard Medical School, Boston, Drs. J. E. Murray, J. P. Merrill, and J. H. Harrison reported to the American College of Surgeons case history of kidney transplant from one identical twin to a brother suffering hopeless, malignant high blood pressure with both kidneys diseased. The twin brothers were 24 years of age. The patient is now free from symptoms and on unlimited activity, with no apparent disability.

Animal Fats Charged as Cause of Heart Disease

Dr. William Dock, professor of medicine, State University of New York, Brooklyn, linked fat-rich foods to heart disease. In a series of lectures presented at the Kansas Medical Center in Kansas City, under sponsorship of the Kansas University Medical School, Doctor Dock emphatically charged animal fats, as contained in meat, eggs, and milk, with arteriosclerosis and degenerative diseases of the blood vascular system. There is ample evidence to support dietary cholesterol as the immediate cause of arteriosclerosis, according to Doctor Dock, and deliberate rejection of the idea is simple unwillingness to accept facts as revealed by research because of reluctance to sacrifice diets rich in animal fats. He believes that American civilization has reached the stage when the Roman Lucretius, wrote: 'In primitive time, lack of food gave languishing bodies to death; now on the other hand, it is abundance that buries them.'

Considering the controversy that has raged over cholosterol in cardiovascular research for ten years, it is fairly safe, for the present, to classify Doctor Dock as a food faddist.

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Human Tuberculosis

Despite advances against tuberculosis and reduction of bovine tuberculosis in the United States, and in mortality from this disease, over 1,000,000 cases were reported in the United States, British Isles, France, and Germany in 1953, of which 340,416 were newly reported. —*Am. Rev. Tuberculosis and Pulmonary Diseases, October 1955.*

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Greyhound Outruns Quarter Horse at Billings, Montana

In a match race, a Greyhound named Mopolis finished seven lengths ahead of Champ S, a Quarter Horse.—*Greyhound Racing Record.*

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We may prove efficacy of a therapeutic agent by experimentation with laboratory animals, but the final criteria of its value are results of field use on the species for which it was intended.

Dogs as Hosts of Tularemia and Vector Ticks in Central Arkansas

ERNEST L. CALHOUN*, CARL O. MOHR, and HUGH I. ALFORD, JR.**

Communicable Disease Center, Public Health Service, U.S. Department of Health, Education and Welfare, Atlanta, Georgia, and Emory University Field Station, Newton, Georgia

Studies in Arkansas in 1951 and 1952 revealed tularemia infections in lone-star ticks, *Amblyomma americanum*, by means of animal inoculation in 11 of 576 pools comprising 28,661 ticks, seven pools of which were from Garland County where there were from 11 to 25 human cases per 100,000 human population during the period of 1937-1951 (Calhoun, 1954, and Calhoun and Alford, 1955). A minimum of one lone-star tick in approximately 2,600 was calculated to be infected to a degree detectible by the laboratory procedure used. In Garland and adjacent counties, the yearly mean number of lone-star ticks was 5.5 per infested dog and 5.3 per infested drag and the mean number of American dog ticks, *Dermacentor variabilis*, was 2.9 and 0.6 respectively.

In a further effort to determine the importance of indigenous animals as reservoirs of tularemia, examinations were made of sera of dogs and wild animals which might be involved. Grateful acknowledgment is made to personnel of the Hygienic Laboratory, Arkansas State Board of Health, for their performance of laboratory test in connection with these studies; to D. H. Meinecke, D.V.M., E. B. Masters, D.V.M., and J. R. Campbell, D.V.M., for their consultation services and assistance in obtaining dog and cattle sera; and to A. M. Washburn, M.D., for his guidance during the investigation and for his review of the manuscript.

Sera for examination were collected from hunting dogs, principally raccoon or fox hounds, and from dogs in cities, mostly from the Hot Springs, Arkansas, dog pound. Since the hunting dogs are trained not to trail or eat rabbits and are penned when not hunting, tularemia infections probably are acquired through bites of infected ticks rather than by eating infected rabbits or by drinking contaminated water. Incidentally, they probably do not have as high an incidence as do farm dogs which may acquire infection by eating small mammals.

Sera from the hunting dogs were obtained from two areas, each of which was six by ten miles in extent. In one area, tularemia-infected lone-star ticks had been found and in the other area no infections had been located.

Prevalence of dogs with tularemia antibodies was essentially the same; 24 and 26% respectively, among 65 hunting dogs from the known tularemia-infected area and among 37 from the area in which no infected ticks had been found. Titers varied as follows: From 1:20 to 1:80 in 13 dogs, 1:160 to 1:320 in 25 dogs, and 1:640 to 1:2560 in six dogs.

Antibodies against tularemia also were found in four of 28 dogs from urban habitats. All but three dogs were from the Hot Springs, Arkansas, pound; 26 were adults, and two were less than one year of age. One of the four positive adult dogs showed a titer of 1:40 to 80 and two had titers of 1:160.

In a sample of 27 dogs tested for both tularemia and brucella antibodies, no positive reactions were obtained for brucella organisms but tests for tularemia were positive in 12 cases.

Information was obtained on the prevalence of tularemia, as indicated by agglutination tests, with respect to age of dogs. Although data are insufficient for detailed statistical analysis, they do suggest that the proportion of dogs with antibodies against tularemia tends to increase in this area until animals are about two years of age.

The following animals were examined by serum agglutination test: 24 opossums, five raccoons, 15 cottontail rabbits, five white-footed mice, two domestic cats, one fox squirrel, and two black-tailed jackrabbits. Seven opossums and two raccoons were found to have antibodies against *P. tularensis*, the raccoons in titer of 1:160 and 1:320 and the opossums in titer as follows: Three at 1:20 to 1:80, two at 1:160 to 1:320, two at 1:640 to 1:1280.

There is strong evidence that the dog is a primary reservoir of *P. tularensis* as well as a principal disseminator of the lone-star tick in the central Arkansas area. However, in other situations characterized by different mammalian and ectoparasitic fauna, entirely different epizootiologic relations may occur.

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Hypothermia by Cold Temperatures†

ROBERT P. KNOWLES, D.V.M., Miami, Florida
and STANLEY C. WASMAN, D.V.M.,
Miami Beach, Florida

Hypothermia is defined as subnormal temperature of the body. It is accomplished by a refrigeration technic employed not uncommonly in human surgery. Its purpose is to allow the surgeon to invade the heart without cardiac blood flow. At normal body temperature range under anesthesia, blood flow can be limited only up to approximately three minutes. Under conditions of hypothermia, cardiac blood flow can be restricted up to 15 minutes, with relative safety.

Preparation of the Patient

A dog having 3+ microfilaria count as determined by microscopic examination of fresh blood smears was brought from Florida by Doctor Knowles for demonstration. Body temperature of the patient was 101 F. when prepared for anesthesia, which was accomplished by slow intravenous injection of pentobarbital (nembutal)® to effect surgical depth. The necessity of deep anesthesia was pointed out, otherwise shivering may occur during refrigeration and interfere with the cooling process. A mouth gag and intratracheal catheter were applied and attached to an automatic breathing oxygen unit. Animal was packed in cracked ice and was allowed to remain in the tank for approximately 30 minutes. When displayed to the television audience, the patient's body temperature, as determined by special thermometer, with a cathode inserted well forward in the rectum, was 84 F. It has been determined that the heart muscle has a well developed ability to extract oxygen from the blood at low temperatures, even though arterial oxygen concentration be low. Oxygen requirement of the body at such temperature, and at the reduced metabolic rate is approximately 20% of normal.

At this point (82 F.) the patient was taken from the ice tank and placed on preheated heating pads. Body temperature continued to drop to approximately 77 to 78 F., which is the optimum temperature of this technic.

When the animal was ready for surgical procedures involving the heart, Doctor Knowles proceeded by demonstrating technic for removal of adult heartworms. He cautioned of two dangers of the technic: (1) Air embolus, and (2) ventricular fibrillation. Incidence of the latter is higher at body temperatures below 76 F. but is a problem at any time. Heating pads provided may be warmed during procedures, in order that too low temperatures can be avoided, since, at this stage, the body's ability to warm itself is lost. It is necessary to supply warmth to reestablish normal body heat or the patient will succumb.

Surgical Technic

Successful invasion of the heart cavities was first demonstrated on a child in 1938. Since that time many workers have studied various aspects of hypothermia and its surgical usefulness.

Site of invasion of the chest is through the right fourth interspace to expose the lungs and heart. Lungs are reduced in total size. Blalock clamps (a guillotine-type, non crushing clamp) are placed on the anterior and posterior vena cava, vena azygos, in a sequence and timing so that the organ empties itself, at which time the aorta clamp is applied. Sixty seconds are allowed between clamping inflow vessels and the aorta, in which time the heart is practically empty of blood. Incision was then made into the pulmonary artery and adult heart worms removed. Forceps may be extended into the artery and its branches, or into the right atrium where worms commonly are found.

Clamps are released in the reverse order in which they are applied. If desired, the heart may be filled with Ringer's solution to avoid dangers of air embolus. In the demonstration no solution was used, but care exercised to avoid allowing too fast flow into the heart suddenly, with resulting fibrillation. Fibrillation did occur but was not severe.

Suturing incision in the pulmonary artery was accomplished by careful closure using #00000 blood vessel silk adapted to special needle manipulated with small needle holder. Incision in chest wall was closed with stainless steel and silk, heat pads were applied to the body to warm quickly.

Doctor Knowles explained that the technic for heartworm removal is not routine in his practice but that the exercise under hypothermia challenges the best surgical knowledge and skill. He stated that lowering the body temperature of surgical patients has practical applications in veterinary medicine, particularly in invasion of the chest. The technic has promise of allowing procedures not otherwise possible.

†Presented at the 22nd annual meeting of the American Animal Hospital Association, Detroit, Mich., May 4-7, 1955.

®Abbott Laboratories, North Chicago, Ill.

A.A.H.A. Question and Answer Luncheon

Q. What has become of courtesy?

A. I think courtesy is becoming, unfortunately, a lost art in American business. I can not explain why or where it has left the scene but I am sure that its absence has been recognized.

There is no single ingredient I can give a higher rating for success in your client relations than the exercise of courtesy. One may improve his facilities, methods, and other features, some of which are costly. Courtesy costs nothing. A smile of welcome, reassurance, and acknowledgement of inquiries are courtesies that may mean the difference between an average and a successful business.

Courtesy is contagious. Courteous relations with employees makes a distinctive climate in the establishment. If each employee is accorded the dignity of an individual, the basic character of the organization is elevated and becomes a landmark for successful practice.—*Mr. Wm. F. Prigge, American Airlines, New York.*

Q. Is a veterinary hospital a service institution primarily for the benefit of the public, or is it one man's business?

A. Service must come first. All else comes with its extension to the public. If service is not given, all objectives fail. I believe a veterinary hospital is a public service institution.—*—Joseph A. S. Millar, D.V.M., Deal, New Jersey.*

Q. What trends are apparent concerning size of veterinary hospital facilities?

A. I have a feeling that the trend in development of veterinary hospitals may have to be towards the larger institutions manned by two or three veterinarians. I believe it will be toward the two-man rather than the one-man institution.

I believe the time is coming that many of our institutions started by individuals will outgrow the individual. For a long while in the establishment I direct, Doctor Engle was the important person. Today I am not concerned with whether Doctor Engle is important or not. I am concerned whether the Summit Dog and Cat Hospital is important, and whether the people who come there get the service they seek. I believe that as time moves on that oftentimes the organization grows larger than was planned or believed probable. In the interest of better service, it then becomes necessary that a professional staff member is always available to give service which is occurring sufficiently frequently to designate a trend.—*Joseph B. Engle, D.V.M., Summit, New Jersey.*

Q. What is a safe procedure to rid a small animal hospital of cockroaches?

A. Since chlordane has been used in our practice as a parasiticide for dog ticks, we have had no cockroach invasion.—*W. F. Irwin, D.V.M., Tulsa, Oklahoma.*

Q. At what age should cats be castrated?

A. We tell our clients, "When it gets to be a nuisance, bring him in." We prefer to delay surgery until the cat is at least six months of age.—*Julius J. Fishler, D.V.M., Elkhart, Indiana.*

Q. What does the public expect and desire from veterinary practitioners?

A. A survey was conducted in the city of Miami, Florida, some time ago through activities of the University of Miami. It was learned from that survey that over 50% of the people leaving a veterinary hospital fail to have a clear understanding of what the practitioner told them to do with the patient they had presented for diagnosis and treatment, for which they had paid a fee. It was learned, however, that in most instances the public was satisfied with veterinary service to pets.

We learned, I believe, two important things from this survey. The public expects convenience. For this reason, the small animal clinic located in the local community is apt to be patronized first, providing the practitioner there who meets the public is courteous and renders an efficient service.—*M. L. Morris, D.V.M., Topeka, Kansas.*

Q. Give diagnosis, treatment, and prognosis of epileptic type siezures in the dog of unknown etiology.

A. To answer this broad question in a general way, we might begin by stating that age and history would serve to suggest possible diagnosis. We approach such problems by advising the owner that symptoms probably are related to organic brain damage. Under this heading we place: (1) Encephalitis, possibly resulting from viral infection that may have been obvious or subclinical, (2) brain tumors (considering breed susceptibility), (3) encephalitis having a senile or circulatory alteration as a contributing cause.

Management includes the use of dilantin

sodium with phenobarbital®[1]. We begin treatment with large doses repeated two or three times daily, depending on the size of the patient. Control of convulsive seizures is our first objective, after which a maintenance dose is established.

A saline laxative is administered in some cases, if indicated.—*J. H. Mark, V.M.D., Philadelphia, Pennsylvania.*

Q. Are the usual anal and perianal neoplasms benign or malignant?

A. Perianal tumors may be either benign or malignant. Most common ones are benign adenomas. They occur on males and are supposed to subside on castration of the patient. It is not always possible to classify a tumor as benign or malignant by gross examination.

Benign tumors respond to *x*-ray therapy. Castration may cause the neoplasm to subside. Recurrence is not uncommon following radiation.—*Gerry B. Schnelle, V.M.D., Boston, Massachusetts.*

Q. Please give your recommendations for use of whipcide®[2].

A. We give 250 mg. per kilogram of body weight in two divided doses at 12-hour intervals, followed by a light meal. In fact, one can give it with the meal.—*Justin E. Jordan, D.V.M., Indianapolis, Indiana.*

Q. What condition or deficiency exists when toenails split and break off?

A. The toenail is protein in nature. When brittleness occurs, it may be associated with a thyroid disease, similar to changes observed in the human fingernails under conditions of thyroid pathology.

It is suggested that a careful check be made of the thyroid and the metabolism. The problem is one of protein metabolism in the liver, probably associated with metabolism of methylene or choline. I would look into the methionine requirement of the dog carefully to assure adequate protein intake of high biological value.—*Mark L. Morris, D.V.M., Topeka, Kansas.*

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The past 25 years has witnessed a complete turn of the cycle of things from the depression depth of the early 30's to the confident era of recent years.

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Workers at the University Virus Laboratory at Berkeley, California, have succeeded in crystallizing virus of poliomyelitis.

®[1]Parke, Davis & Co., Detroit, Mich.
®[2]Pitman-Moore Co., Indianapolis, Ind.

Carbomycin in Canine Distemper Complex

LEO L. LIEBERMAN, D.V.M., Waterford, Connecticut

In this practice there has been no chemical or combination of chemicals and serum* which has achieved a high degree of satisfactory results in the treatment of canine distemper and related diseases. It is recognized generally that serum alone will not alter the course of distemper once symptoms are recognized. In view of the high incidence of distemper infection in this area and the results from ordinary materials available, it was considered of interest to report the most efficacious treatment as determined by the successful conclusion of 62 of 70 selected cases treated during the past two years, using magnamycin® *per os* and antiserum intravenously (IV). It is hoped that others may duplicate these results.

In the absence of any reliable and rapid laboratory diagnostic methods, it is next to impossible for the clinician to differentiate in the living patient on clinical grounds alone, canine distemper, canine infectious hepatitis or the case affected by both viruses. In any event, the treatments for the cases herein reported have remained the same.

It also has been found that some brands of serum, when used intravenously at body temperature, have been followed by a severe frightening reaction. Antiserum of various manufacturers varied in this regard.

Magnamycin[1] is a monobasic, crystalline antibiotic produced by *Streptomyces halstedii.* It is soluable in water and forms highly soluable salts with organic and inorganic acids. Oral administration in laboratory animals has revealed no untoward symptoms or pathological changes. Studies of the blood, urine, and liver function in man revealed no ill effects after eight weeks of use orally.

In vitro, magnamycin[2] is active against the Gram positive group of bacteria. Staphylococci, particularly those resistant to penicillin, and enterococci are sensitive to magnamycin in low concentrations. Wong, *et al*[2] has demonstrated that this antibiotic is highly active against many Rickettsiae and large viruses (mice and guinea pig tests). Magnamycin[2] follows the penicillin pattern of resistance

*Commercial canine distemper and infectious hepatitis antiserum (canine origin).
®Chas. Pfizer Co., Brooklyn, N. Y.

rather than the streptomycin pattern, *i.e.*, resistance develops slowly.

Baker[4] in his preliminary studies of the distemper virus in embryonating eggs found that magnamycin was the only antibiotic that regularly inhibited the growth of the virus. Wong and James[5] found it to be the most highly active antibiotic of those tested (aureomycin, terramycin, chloramphenicol, streptomycin and penicillin) against the pleuropneumonia-like organisms (PPLO) of chickens and turkeys. Stephenson[6] at the American Animal Hospital Association meeting in New York City in 1954 reported the frequent finding of pleuropneumonia-like organisms in cases of clinical distemper and in normal animals. The pathogenic significance of these microorganisms in distemper are not completely understood. Others are suspected of being pathogenic under some circumstances.

All of the cases listed in this series have been followed for more than two months after apparent clinical recovery and, except for the slight "tic" noted in one case, all animals are normal at this writing.

The following case reports of successful cases illustrate the rapid and definite response of the distemper-complex sick dogs to the combined serum-magnamycin therapy.

Case 1. On March 4, 1954 a five-month-old male terrier-type dog weighing 20 lb. was presented with a temperature of 104 F., general malaise and a seropurulent rhinitis. Diagnosis was distemper complex. Twelve cc. of serum were administered intravenously. A 250 mg. tablet of magnamycin and vitamin B complex tablet were given by mouth every eight hours. On March 9 the temperature was normal, the dog was given 10 cc. of serum IV and the antibiotic was discontinued. The animal appeared to be much improved.

On March 18 the dog appeared normal. Ten cc. of serum were given subcutaneously. On June 4 the dog appeared normal. Ten cc. of serum and 5 cc. of killed tissue vaccine were administered subcutaneously.

Case 2. On May 4, 1954 a Cocker Spaniel cross, six months of age and unvaccinated, was presented with a history of being ill for several days. Vomiting and marked nervousness were principal symptoms. Temperature was 105 F. The pupils of the eyes were dilated noticeably under the bright examining lights. Clinical diagnosis was distemper-hepatitis complex with a prognosis of encephalitis.

Twenty cc. of serum were given intravenously. One 250 mg. tablet of magnamycin and vitamin B complex tablet were given by mouth every eight hours.

On May 7, the temperature was 102.8 F. and the patient noticeably improved. Antiserum (15 cc.) was repeated. Magnamycin therapy was discontinued on May 8. On May 14, the dog appeared normal and a third injection of antiserum was administered. On June 4 the dog appeared normal. Ten cc. of serum and 5 cc. of killed distemper vaccine were administered.

Case 3. On August 27, 1953 a six-week-old male Retriever was given serum and a vermifuge. The dog did well and was not returned for distemper vaccination.

On March 18, 1954, the dog now weighing 60 lb. was presented with a history of malaise for several days. Temperature was 104 F. Serous rhinitis and conjunctivitis were present. Several dogs in the neighborhood were reported to have encephalitis. The tentative diagnosis distemper-hepatitis complex.

Forty-five cc. of serum were given intravenously. One 250 mg. magnamycin tablet and a vitamin B complex tablet were given every four hours.

On March 21, the temperature was 103 F. The attitude and the appetite of the animal were improved noticeably. Twenty cc. of serum were given. On March 23, the temperature was normal. Antibiotic therapy was discontinued.

On April 1, the animal appeared normal in all respects. Serum injection repeated. On April 20, the dog appeared normal. Serum was again given intravenously and 5 cc. of killed distemper vaccine subcutaneously. On May 24, infectious hepatitis vaccine was administered. A slight tic was noticed in the left thigh. The animal has been well since that time.

Case 4. On Feb. 13, 1954 a Setter-type dog weighing 45 lb. was presented with a temperature of 104 F., purulent conjunctivitis, purulent rhinitis, cough, pneumonic rales and a very languid attitude. Tentative diagnosis was distemper-hepatitis complex with pneumonia.

Treatment included intravenous administration of 30 cc. serum, and one 250 mg. tablet of magnamycin and a vitamin B complex tablet every six hours for five days. Appetite and activity were considerably improved

(Continued on page 31)

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Veterinary Open House at Washington State College

DONALD E. CLARK, Senior Student,
Pullman, Washington

For more than 20 years, students in the College of Veterinary Medicine at The State College of Washington have held annually an open house for the benefit of friends and students in and around Pullman, Washington. Visitors to this annual affair have the opportunity of inspecting the facilities of the veterinary college, seeing demonstrations of some of the most recent technics employed in veterinary practice, and gaining some idea of the type of work that students must complete prior to being granted the degree of Doctor of Veterinary Medicine.

While the date of the first veterinary open house at W. S. C. is unknown, the affair has met with widespread interest and enthusiasm. In recent years attendance has become so great that students now are faced with the problem of finding some means of accommodating more people during the short time allotted to open house (three hours of one evening) or of extending the hours. Last spring almost 1,000 people passed through the College of Veterinary Medicine during the three-hour period.

All of the work that goes into the presentation of open house is done by the students themselves. The president of the student chapter of the American Veterinary Medical Association customarily sets the wheels in motion by appointing a student chairman in charge. Each of the four Jr. A. V. M. A. class representatives then select a chairman from his class to work with the general chairman. These class chairmen draw up an outline of the material that will be presented by their class so that the students may sign up to work on the various displays. A few of these displays are shown in the accompanying series of pictures taken of the veterinary open house for 1955.

This annual show has the enthusiastic endorsement of faculty and students and is considered as excellent public relations.

Key to pictures appearing on facing page:

1. Architect's model of the W. S. C. veterinary college. The white roof indicates proposed additions to the existing buildings. Construction is expected to be underway within one year.
2. "Welcome to the veterinary open house!"
3. Microscope examination demonstrated by freshmen students.
4. "He holds the lantern . . ."
5. The use of gases for general anesthesia is demonstrated by a sophomore student.
6. Routine inspection is not to be taken lightly.
7. Small animal oxygen chamber.
8. Internor view of newly completed diagnostic and therapeutic radiology laboratory which will be open for inspection during the next open house.
9. The cow with the "hole in her side" attracts the attention of most visitors.
10. W. S. C. coeds anxiously await their turn for blood-typing.
11. Two student, husband-wife teams prepare to inspect a boxer.
12. The simplex will be used many times by these junior veterinary students before and after graduation.
13. A working model helps explain the formation of urine.
14. Large animals are easily secured to this table when it is in a vertical position. Hydraulic crank then tips table to a horizontal position. Here senior students demonstrate intravenous therapy.

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In an editorial (*New England Jour. Med.*, Aug. 25, 1955) the author states that there has been a significant increase in the number of psittacine birds solds as pets in the United States since the Public Health Service relaxed interstate and foreign quarantine regulations in 1951. The number of cases of human psittacosis have risen considerably since that time. Whereas a total of only 25 to 30 cases were reported annually to the National Office of Vital Statistics for the period 1945 through 1951, there were 135 cases reported in 1952, 169 in 1953, and 303 for the first six months of 1954.

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Carbomycin in Canine Distemper

(Continued from page 29)

in three days. Temperature was recorded at 102.5 F. Serum was repeated Feb. 18, at which time the temperature was normal. Serum treatment was repeated on March 4 and again on April 24 when killed distemper vaccine was administered simultaneously. This animal has remained in good health.

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American Public Health Association Meeting

Approximately 6,000 persons registered at the 83rd annual meeting of the American Public Health Association held in Kansas City, Missouri, November 14-18, 1955. A 127-page booklet provided members a guide to the various sectional meetings devoted to many phases of public health interest. These were held either in meeting rooms of the Municipal Auditorium or at downtown hotels and included: Dental Health, Sanitary Engineering, Epidemiology, Food and Nutrition, Laboratory Research, Maternal Care, School Health, Nursing, Public Health Education, Occupational Diseases, Vital Statistics, et cetera.

Two meetings were scheduled of unusual interest to about 60 veterinarians in attendance presently in public health work. Subjects discussed included: Trichomoniasis in Swine, Bat Rabies, Ornithosis, Public Health in Europe, New Poultry Ordinance, Rabies Control in Houston, Harris County, Texas, and Methods of Estimating Dog Population. The following veterinarians contributed to the official program: Brig. Gen. Wayne O. Kester, Dr. James H. Steele, Major Robert P. Juni, Dr. Raymond J. Helvig, Dr. Joseph W. Atkinson, Dr. Ernest S. Tierkel, Lt. Col. Kenneth F. Burns, Dr. L. H. Schwarte, Dr. H. E. Biester, and Dr. Oscar Sussman.

The exhibit section attracted a continuous flow of visitors during the entire meeting period. About 20 meritorious educational and 40 commercial exhibits were attractively displayed and manned by trained personnel. The American Veterinary Medical Association displayed the nicely prepared exhibit (displayed at Minneapolis) stressing Care of Laboratory Animals and the theme of A.V.M.A. cooperation in the solution of problems related to public health. Dr. Nathan R. Brewer, University of Chicago Medical School, was in charge of this exhibit.

The program of the World Health Organization (WHO) was outlined by Dr. Harold S. Diehl, M.D., dean, University of Minnesota Medical School, which was followed by an address by Hon. Hubert H. Humphrey, Senator from Minnesota, which dealt with the high appraisal of our government for the work of this organization in many foreign lands. Work is given generous financial support and is directed toward disease control and eradication among underpriviledged peoples.

Poliomyelitis Session

A special session was held for discussions of practical experiences with poliomyelitis vaccine, which attracted an overflow audience. Merril H. Malcolm, M.D., California Department of Public Health, presided. Dr. Jonas E. Salk, credited with perfection of the tissue culture vaccine employed in field trials in 1954 and produced commercially this year, used charts projected on a screen to reveal in a modest and scholarly fashion, results of his studies since the unfortunate experiences earlier this year. The gist of his message was that sediment in the virus suspension at the time of formalization inhibited the inactivating process. This particle size theory appears to be sound. Removal of all sediment from vaccine lots resulted in an improved product having equally high antigenicity. Public Health Director Dr. Leonard A. Scheele stated that new regulations now require virus suspensions to be filtered to remove all sediment within 72 hours of the time formalin is added. Safety tests also have been expanded to satisfy the most skeptical as to the safety factor of current production lots released for field use. The statistical reports on 1955 usage of the vaccine in the United States and Canada indicate reduction of incidence in endemic area of infection, particularly of the paralytic type.

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Rabies Control Week in St. Louis, Missouri

Mayor Raymond R. Tucker of St. Louis, Missouri, proclaimed the week starting Monday, October 31, 1955, as Rabies Control Week.

In the proclamation issued it was stated that the metropolitan area had suffered cyclic recurrence of rabies among dogs for 30 years. It was also noted that 85% of these animals were unvaccinated within the past year, which fact posed a serious threat of recurring enzootic. It referred to favorable vaccination experience in 1951, and urged cooperation of all to accomplish an effective vaccination program.

Low incidence of rabies in the St. Louis area for the past two years apparently has lulled owners into a false sense of security, according to the city's health commissioner. He added that vaccination of dogs during late autumn or early winter will develop a protective immunity level before the annual threat of rabies during spring months.

C

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JA

a single-dose vaccine against canine distemper

VIROVAX*

*Trade name for: Virovax, Canine Distemper Vaccine, Modified Live Virus (Chick Embryo Origin, Vacuum Dried) (P.-M. Co. Bio. 668).

In healthy, unexposed puppies, Virovax will produce a complete cell block against distemper in two days. This effect persists until true immunity has been established.

It is satisfactory to vaccinate dogs with Virovax at 3 months of age, when a single dose is sufficient. In hospitals or kennels, where earlier exposure may be anticipated, puppies should be vaccinated shortly before or soon after weaning, with a second dose at 4 to 6 months of age.

The dose for all dogs is 2 cc., injected subcutaneously, within one hour after restoration of the vaccine. As with all immunizing procedures, normal healthy animals respond best.

PITMAN-MOORE CO. DIVISION **ALLIED LABORATORIES, INC.** INDIANAPOLIS

Vesical Calculi in Cats

A valuable new study by Robert L. Stansbury, D.V.M. and Roger W. Truesdail, Ph.D.

(Originally published in THE NORTH AMERICAN VETERINARIAN, Vol. 36, No. 10, October, 1955. Reprints available without charge, as explained below.)

Practitioners in the small animal field will welcome the results of this long and careful study of the occurrence of vesical calculi in cats receiving different diets. The project began with an analysis of five-year case records of cats in the Arroyo Animal Hospital, Pasadena, California. Thereafter, a group of 75 cats were observed under strictly controlled conditions for thirty-three months. They were separated into groups, fed different diets, and watched carefully for incidence of vesical calculi.

Of the group of cats fed exclusively on Puss 'n Boots Cat Food from commercial packs, *not one developed a true vesical calculi.* Cystic calculi were recovered from two cats fed on fresh horsemeat and dietary supplements of fresh liver, milk, vitamin B_1 and D, and calcium.

The authors conclude that "no valid scientific conclusions can be drawn as to the causes of the formation of vesical calculi in cats". The details of the study leading to this judgment will be of great interest to every practitioner.

Reprints Available Without Charge

If you missed the original article in the NORTH AMERICAN VETERINARIAN, the makers of Puss 'n Boots Cat Food will be glad to send you a free reprint. Just write, on your professional letterhead, to

Coast Fisheries, Division of
The Quaker Oats Company,
Wilmington, California

PUSS'n BOOTS

America's largest selling cat food . . . adds the plus in health, beauty, vigor.

Advances Made In Swine Practice

H. C. SMITH,* D.V.M., Sioux City, Iowa

Part III: Swine Leptospirosis

Readers are referred to VETERINARY MEDICINE, 50:565 (Nov.), 1955 and 50:683 (Dec.), 1955 for parts I and II of this series pertaining to important swine diseases.

There is some evidence to suggest that the reported incidence of leptospirosis in swine is still understated considerably. Incidence of past years, and even that reported now in some areas, may be the result of inability to recognize the disease. Not only are clinical manifestations frequently mild, transient, or inapparent, but serological tests have been uncertain. Only recently have laboratories run any sort of tests routinely; now a number do so, throwing new light on pathogenesis of porcine leptospirosis.

Some clarification of serological tests now proposed will have to be evaluated. However, progress is being made toward perfecting understanding which will indicate accurately the relative importance of leptospirosis as a disease entity in this species.

DUE to the increasing incidence of leptospirosis in swine within the past two years, there is a possibility that it may become one of the more important diseases of swine. There appear to be several reservoirs of infection in many species of animals, both domesticated and wild. Apparently recovered swine may be carriers of the spirochete for long periods. This fact is extremely important because of the possible wide dissemination of infection in breeding stock. We believe that leptospirosis in swine should be considered as a potentially important disease.

K. Wagner[1], 1942, submitted evidence that jaundiced pig carcasses should be examined for Leptospira. Human cases developed after they had handled some jaundiced animals. The disease occurred only in the workers that were engaged in slaughtering operations.

O. Gsell[2], 1946, reported more than 50 human cases of leptospirosis of swine origin. The disease was seen in young men who came in contact with hogs or hog excreta. The organism responsible for the condition was *Leptospira pomona*. It was possible to recover this organism from blood cultures at the end of the first week of illness and agglutinins appeared in the blood during the second week.

Spread of the disease through the digestive tract in swine is not probable, due to the acidity of the stomach. Pathogenic leptospires do not live long outside the body, especially if the environment is acid. Affected swine exhibit symptoms of loss of appetite, intestinal disturbances, and unsteady gait, especially of the hind legs. Stiffness and cramping also may occur. Gsell suggested the use of the broad spectrum antibiotics in anicteric leptospirosis, if given before the fifth day of illness. This may prevent the disease from spreading. It is the opinion of the writer that this should be tried, but it is most difficult under field conditions.

In 1949,[3] examination of serum from 96 pigs in Israel revealed no agglutination with *L. bovis and L. grippotyphos;* two were positive for *L. icterohemorrhagiae*, while 48 were positive for *L. pomona.*

In 1951, Charles J. York[4] developed a reliable complement-fixation test for the present or past existence of the disease. Since then, other tests have been developed. Among them; the agglutination lysis, capillary tube test and, more recently, the polysaccharide test.

Frank Breed[5], 1951, stated that leptospirosis was not a new disease in swine, but to date most reports were of foreign origin. He concluded that it was quite possible that we had been attributing some of these cases to other causes or possibly calling them an unusual or atypical case of some better known disease condition as may be associated with nutritional disturbances or blood parasites.

Symptoms

Symptoms described early included an initial rise in temperature, loss of appetite, intestinal disturbance, and conjunctivitis. Affected pigs may be unable to stand on their hind legs or may pivot round and round. Muscular rigidity and nervousness were reported.

Typical postmortem changes consist of generalized jaundice with hemorrhages in various parts of the body.

In 1952, the chief of the BAI[6] reported that an investigation of icterus in swine was conducted to determine if leptospirosis might be the cause of the condition. Typical Leptospirae were found in the cortical tubules of the kidneys. The icteric condition was found to be due to an occlusion of the bile duct by roundworms.

In 1952, W. S. Gochenour, Jr. *et al.*[7] reported on the bacteriological-proved leptospirosis of swine in the United States. Their studies were conducted during an explosive outbreak of disease in young shoats, characterized by marked involvement of the central nervous system. They recovered *L. pomona* from an affected animal during an outbreak of hog cholera and *S. cholerasuis* infection.

M. E. Boyer[8], 1952, reported that, of a herd of 77 pregnant sows, 40 had aborted. Blood titers for leptospirosis was as high as 1:100,000. It was his opinion that the Leptospira may have been picked up from the affected cattle on the farm.

On September 18, 1953, by means of a circular letter[9] to all graduate veterinarians in the United States, Pitman-Moore Company announced a new bacterin for prophylaxis. Although classed as a bacterin, it is cultivated on living chick embryo, and is freeze-dried under high vacuum to preserve its antigenicity until injected. This vaccine can not possibly transmit infection to any vaccinated animal. It was primarily intended for cattle, but, since its introduction, it has been used extensively by veterinarians in swine herds. The vaccine produces little or no local or systemic reaction.

Kidney lesions revealed at autopsy — jaundice, hemorrhage, bloody urine, and edema are not diagnostic of leptospirosis and may result from other infection. The above illustrates interstitial nephritis and hemorrhage in the kidney pelvis.

Vaccination with this product does not stimulate the production of complement-fixing antibodies and, therefore, does not interfere with subsequent testing of the blood of the animals vaccinated.

Theodore Burnstein and James A. Baker[10] reported that, of 285 serum samples collected from swine culled at large packing houses, 63 (22%) were found to be positive. Of 39 samples of hog cholera antisera, representing over 6,000 hogs, all contained leptospiral antibodies.

Since experimental *Leptospira pomona* infection was characterized by the pigs having interstitial nephritis, an attempt was made to correlate positive serological findings for *L. pomona* with the presence of the kidney lesions. The work showed that 50% of the kidneys from the 114 swine studied had histopathological lesions. However, other causes may produce similar lesions.

The writer believes that work with urine was of particular interest to veterinarians in that it discloses that the pH values of the urines varied from acid to alkaline but are usually in the alkaline range. The number of visible organisms does not appear to be affected by the pH, since some urine samples in the acid range exhibit numerous organisms while, in others, the converse occurs. It is interesting to note that urine having a pH7 or above usually has active Leptospira, while, in those that tested below pH7 (neutral), organisms appear inactive but viable.

Burnstein and Baker[10] concluded that, if the growth and multiplication of the Leptospira in the host are criteria, the organism is better adapted to pigs, as evidenced by the

large numbers excreted in the urine as well as the length of the carrier status. Thus, it appears that swine may be the natural host for *L. pomona*.

Their transmission experiments indicated that seven of seven pigs inoculated intranasally were infected, 25 of 25 pigs inoculated subcutaneously, but only one of seven became infected when the organisms were given by mouth. By contact they infected ten of ten.

A report from Illinois[11], 1954, indicated that abortion had been a common symptom in several outbreaks in swine. Abortions usually occurred during the latter part of gestation.

In addition to abortions, other symptoms noted were fever, loss of appetite, bloody urine, jaundice, anemia, and abnormal and reduced milk flow in affected sows.

It was suggested that freshly aborted pigs or blood samples from aborting sows should be submitted to a laboratory for bacteriological and serological examination. Apparently recovered sows are immune, but remain carriers and may give off the spirochetes in the urine for long periods.

W. A. Aitken[12], 1954, believed that leptospirosis may have been the cause of some unexplained abortions in swine. When abortion occurred on some farms, the sows and boar were blood-tested for brucellosis, only to find them negative. Some authorities thought that the abortions may have been due to a virus infection, swine "flu" or even a feed condition.

E. H. Bohl *et al.*[13], 1954, stated that from their observations *L. pomona* is another agent capable of causing abortion in swine. The finding of great numbers of Leptospira in the kidneys and liver of a weak pig which had been born only six hours previously appeared to be significant. The infection must have been transmitted by the sow, although no clinical signs of the disease were observed. A possible explanation may be that pregnant sows become infected with *L. pomona*, with resulting leptospiremia, due possibly to the motility of organisms which reach the fetuses. Abortion may follow death of fetuses *in utero*.

H. S. Bryan[14], 1954, reported that abortion in swine appeared to be one of the outstanding features of leptospirosis in Illinois. Of 263 swine herds tested, 77 (29.3%) had one or more positive animals in the herd.

W. S. Monlux[15], 1954, stated that any symptom or lesion produced by leptospirosis could be duplicated by other diseases. He believed that, by the time the disease is recognized in a herd, most of the animals may have had a mild attack and be immune.

Werner Sidler[16], 1954, found that leptospiruria of swine could be stopped completely by the injection of streptomycin. The dose was from 0.25 to 0.5 gm. per 100 lb. body weight.

Paul Bennett[17], 1954, described a case showing convulsions and encephalitic symptoms. The brain revealed well marked hemorrhagic and edematous lesions.

Incidence

The Committee report of the United States Livestock Sanitary Association[18], 1954, stated that leptospirosis was a newcomer in our list of transmissible diseases of swine. Its presence was indicated by the number of positive blood samples.

In 1954, E. H. Bohl *et al.*[19] reported that it appeared that leptospirosis is widespread, at least in the Midwest. Several types of Leptospira are capable of infecting swine; *L. canicola, L. hyos, L. icterohaemorrhagiae* and *L. pomona*. Thus far *L. hyos* has not been found in the United States.

Antibodies for *L. pomona* have been detected in three or four brands of commercial hog-cholera antiserum. This, in itself, is indicative of wide prevalence. Clinical signs are slight and transitory, except in pregnant sows in which abortion and death of new-born pigs may occur. A high rate of abortions has been observed in several herds of swine. In most cases, sows abort during the last two weeks of the gestation period. Sows that have aborted once due to Leptospirosis have not been observed to do so again from this disease.

Swine appear to be important carriers since they apparently eliminate leptospira in their urine for a longer period and in greater numbers than other animals. Gilts have become infected by the introduction of the injective agent in the conjunctival sac, the nose, and the vagina.

A report from the School of Veterinary Medicine of the University of Illinois in 1954[20] stated that between January 1952 through May 1954 a total of 4,518 blood samples from swine, comprising 575 droves, were tested by the agglutination-lysis test. The test revealed that 878 blood samples or 19.5% were positive for leptospirosis.

J. W. Ryley and G. C. Simmons[21], 1954, reported from Australia that natural infection of swine with *L. pomona* produces mild or inapparent symptoms. No clinical evidence of infection was manifested by one pregnant sow inoculated intramuscularly with pure culture. Excretion of organisms commenced 13 days post-inoculation and continued for 45 days. The litter farrowed 32 days after inoculation consisted of eight pigs, four of which were stillborn and three dying the first three days. Only one survived and apparently was healthy at weaning.

Wm. L. Sippel[22], 1954, reported that leptospirosis has occurred in either cattle or swine in 48 states. Animals contract leptospirosis directly from other animals. Unknown animals or insect reservoirs may be involved in the disease. Ticks may be able to spread the disease.

In experimental swine, there is an incubation period of three to 12 days. During this time, Leptospira usually can be recovered from the blood. The serological response to infection usually requires nine to 14 days to develop to a diagnostic titer. Following the disappearance of the Leptospira from the blood, they appear in the kidneys and may be given off in the urine for as long as 159 days or longer. The time interval between infection and the act of abortion in sows is not definitely known.

P. D. DeLay[23], 1955, reported on three herds of swine affected with Leptospira in which abortions had occurred. Positive titers to *L. pomona* were found in serum samples from all three herds. Organisms resembling Leptospira were found in sections of the kidneys of fetuses from two of the herds.

A. H. Quin[24], 1955, called attention to the fact that leptospirosis in swine may produce abortions at any time during gestation and is not accompanied by visible sickness. The disease involves droves which are either Brucella negative or in those herds with a low incidence of brucellosis.

Herbert Marsh of Princeton, Illinois, reported that he had obtained satisfactory results by vaccination of apparently normal sows with two doses of the vaccine. He recommended strict isolation of aborting sows and immunization of the balance of the herd.

One of the chief losses, in addition to the lost pigs, is an unthriftiness of survivors.

W. G. Hoag and W. B. Bell[25] of the Virginia Polytechnic Institute announced in 1955 the development of another type of vaccine for leptospirosis which gave 100% protection against both clinical and carrier stages of the disease.

Another commercial laboratory developed a vaccine which gave a high degree of protection within seven days after vaccination.

Differential Diagnosis

Differential diagnosis of leptospirosis in the field is most difficult. The most accurate means are serological tests. Differentiation should be made between Brucella infection, Listeria, Aujeszkies disease, salt poisoning, hog-cholera, eperythrozoonosis, and plant and chemical poisonings.

Attempts to curb dissemination in animals should be: (1) Prophylactic immunization; (2) elimination of carrier animals; (3) chemotherapeutic agents that will destroy the spirochetes in the animal's body, and (4) the testing of all boars and gilts before adding them to new herds.

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Foot-and-Mouth Disease Vaccine

The development of a tissue culture vaccine for immunization of cattle against foot-and-mouth disease at the USDA's Plum Island Laboratories does not mean a reversal in plans for slaughtering infected and exposed animals in the event of an outbreak in the United States. The news is especially important because an inexpensive vaccine can be produced in quantity for use where foot-and-mouth disease now exists. Perhaps, if a good vaccine can be made available at a sufficiently low price, disease incidence might be reduced in those countries where it is endemic, thus lowering the potential of introduction of the unwanted plague. From this standpoint, the news is of interest to American veterinarians.

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Stilbestrol Experiments Reveal Average 16% Growth Gain

Cattle receiving rations containing the hormone stilbestrol are growing 16% faster, on the average, according to a report summarizing 19 state and university experiments conducted over the past two years.

The recapitulation prepared by the Iowa Agricultural Experiment Station records a 12% average saving in the amount of feed consumed as a consequence of the stepped up daily growth rate. The maximum dose of stilbestrol employed in the feeding experiments was 10 mg. per animal daily.

Involved in the tests were steers, calves, and heifers, and the feeds varied from pure roughage to pure grain. Eight of the 19 experiments took place in Iowa. The growth gains in these tests were below the national average, or 14%, and the feed saving was 10%.

The most spectacular report came from Tennessee. One lot of 16 animals received stilbestrol and another of 26 was fed grain without the hormone. The percent of increase due to stilbestrol was reported at 28 and the percent of feed saved at 18. The daily average gain of the hormone-fed steers was 1.77 as against 1.38 for the check lot.

EDITORIAL COMMENTS

Review of Progress in Veterinary Medicine — 1955

In retrospect, progress in veterinary medicine during the calendar year 1955 followed the pattern set much earlier. That pattern was the steady piecing together of facts, as revealed by research, for building frameworks of understanding of parasite-host relationships concerning many diseases of all species of domestic livestock. Progress has been made as answers to questions posed have taken shape in proper position and relation to the problem.

All segments of the profession have come, in recent years, to greater appreciation of both basic and applied research. Realization appears to have intensified that practitioners, regulatory and public health veterinarians, and others who render a public service owe much to few who have made possible successes by application of these new findings to practice from which the public derives direct benefits.

Notable contributions are too numerous to mention here but range in importance from an added bit to major discovery. Time only will classify these findings in their proper order of importance. Application too has been, in most instances, prompt and with understanding of scientific principles involved. There does exist, however, opportunity for application of proved principles so far not given sufficient attention or trial. In some of these, points are controversial and further study is needed to demonstrate to the most skeptical the possibility of benefit to society.

Lord Boyd Orr is credited with the statement that, "Veterinary medicine is one of the few branches of science in which knowledge can be increased and applied without the danger of doing more harm than good".

The need has stimulated all segments of the profession to greater effort to reduce losses due to diseases and parasites, careful estimates of which indicate their profit-limiting potential to producers. They also could become important from the public standpoint limiting supplies of wholesome meat food products. It is vital to the understanding of the problem that death losses due to diseases and parasites are insignificant when compared to the insidious or hidden losses. These results from nonlethal, or more often, subclinical attacks that interfere with normal body functions. They range from failure of females to reproduce normally through abortion and infertility, to retarded growth and lowered quality of meat food.

To our subscribers and their families everywhere,

Greetings for a Joyous Christmas Season and a Happy New Year.

The Editor and Staff of
VETERINARY MEDICINE

Brucellosis

Progress toward eradication of brucellosis made significant progress during 1955. After only one year of an adequately financed and accelerated program based on newly developed concepts and backed by practitioners' cooperation, eradication of bovine brucellosis is forecast for the not-so-distant future. All concerned are delighted with progress made in all classes of cattle. Brucellosis in swine, however, is of sobering concern to livestock sanitarians. In the overall project too little attention is being given the disease in this class of livestock and the recommended program of control and eradication drags.

Vesicular Exanthema

This disease, a serious threat to the swine industry only three years ago, has disappeared from all but a few counties in the United States. Without question, state garbage cooking laws and regulations have been the prime factor in reduction of incidence as well as other diseases including hog cholera and trichinosis.

New facts have been revealed about swine diseases that have pointed the way for progressive growers. Application of these has

resulted in lowered losses and improved utilization of feed.

Drug Development

Many new therapeutic and prophylactic agents have been made available. In some instances, in such volume as to be confusing. New hormones, antibiotics, and anthelmintics or new combinations have certain definite advantages over those previously made available have led a parade of products. Their indications and uses require more astute study and consideration than ever before and are providing practitioners with more specific and potent agents than have so far been available.

The forward surge in veterinary medicine is apparent in every department of the ever-widening professional field. The driving force behind this progress is the need of humanity and the specter not only of a population that may outgrow its capacity to produce food but of the threat of introduction of diseases not now present in the United States that might limit future profits to growers and supplies to the nation.

In spite of lowered income to farmers, 1955 has been a good year for veterinarians. All can take justifiable self-satisfaction in the steady advances made in professional technics and look with pride to gradual improvement in public appreciation of the role of professionally trained veterinarians in matters concerned with public health.

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D. V. M. Insurance Plan

Announcement of the D.V.M. Insurance Plan for veterinarians and members of their families appear on pages XIV and XV of this issue of VETERINARY MEDICINE.

The original policy called the D.V.M. Plan was originally intended for members of veterinary graduating classes who were not qualified for the Silent Partner policies.

Many of these were young married men, some with families, who needed and wanted some type of coverage that would combine features of income protection and sickness and accident insurance for all member of their families. The policy, as finally written, also included members of veterinary faculties. Later, veterinarians in federal, state, and county regulatory work were embraced in the plan. Finally, on request of the National Committee on Insurance, the Continental Casualty Company agreed to extend the plan as a nation-wide insurance offer. It is now available as additional coverage for owners of Silent Partner policies, and as insurance protection for other members of 44 state veterinary medical associations. Continental Casualty Company has now made available income protection and casualty insurance for all members up to age 70 in these states without regard to past medical history, providing the necessary enrollment participation in each state is met. In instances where less than 100 veterinarians are located in a single state, cooperative group enrollment of more than one state can be effected to meet necessary requirements.

Premiums to all active veterinarians up to age 70 are the same as those originally scheduled and offered to graduating class members. Benefits as prescribed by many policies thought to be adequate are found on examination to be woefully inadequate when considered in the light of present-day costs of hospitalization and medical care. The need stimulated the offer of additional protection.

Under Plan D, the least expensive and recommended to Silent Partner policy holders, benefits are four-fold for the policy holders:

- $10.00 per day hospital board and room—up to 70 days
- $100.00 for miscellaneous hospital expenses
- $100.00 monthly for time loss benefits
- $7.50 to $225.00 surgery (as per schedule)
- Maximum total benefits under Plan D—$1258.00 each period of hospitalization.

For the members of the family (wife and all unmarried children (ages three months to 18 years):

- $10.00 per day hospital board and one room up to 70 days
- $100.00 for miscellaneous hospital expenses
- $7.50 to $225.00 surgery (as per schedule)
- $175.00 maximum maternity benefits

Additional monthly benefits are available for veterinarians who qualify.

The insured will have the advantage of nation-wide security, protection, and operating experience shared in by all veterinarians covered. The Continental Casualty Company, second to none in financial structure and recognized as America's foremost accident and sickness insurance company, underwriting this insurance, has taken leadership in insurance protection for veterinarians. It also has ten

years of experience in the field, beginning with the field test in Illinois by Peter N. Jans, author of the Veterinary Silent Partner Plan and the one who made possible favorable reclassification of veterinarians as risks. Performance and fidelity of the underwriters has been completely satisfactory. Revisions of rates and broadening of benefits for veterinary practitioners have resulted in significant insurance premium savings.

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"Recombined Milk"

An unusual success story, appearing in *Country Gentleman,* June 1955, suggests a means for draining off dairy surplus. In this story, Grover Turbow, dairy scientist and business executive has patented a new process for dehydrating milk and recombining separately handled fats and non-fat solids for an acceptable "fresh milk-like" product. Nearly 90% of the water is removed to save on packaging and shipping to distant, foreign points where recombining plants are busy producing a product for which there is increasing demand.

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Air conditioning of holding rooms for chicks and for broilers has been demonstrated to be practical in some concentrated poultry areas.

The W. W. Dimock Animal Pathology Building

Following the sudden death of Dr. W. W. Dimock in July 1953, members of the Department of Animal Pathology, University of Kentucky, Lexington, recommended to the Board of Trustees that the large building housing the Department be named the W. W. Dimock Animal Pathology Building in honor of Doctor Dimock who served as professor and later head of that department from 1919 to his retirement in 1950. This was done, and a plaque placed in the front hall.

The building consists of a central part and two wings; the north unit (pictured) was constructed in 1942, and the south unit in 1947. Barns housing experimental animals are in the rear, effecting a square for efficient operations of teaching and experimental activities.

The Department of Animal Pathology is a part of the College of Agriculture, University of Kentucky, and also part of the Kentucky Agricultural Experiment Station. Elective courses are offered students in Agriculture but the largest portion (95%) of the budget is for research in animal diseases and parasites.

We are advised by Dr. E. F. Hull that a group of Doctor Dimock's friends provided funds for a portrait which was formally unveiled on November 10, 1955.

Dr. Melvin Cohen of Michael Reese Hospital, Chicago, reported at the postgraduate meeting of the Chicago Medical Society that 107 women were inseminated between 1949 and 1954. Of these, 73 became pregnant and 11 had spontaneous miscarriages. Sixty-one of the successful inseminations occurred within the first three months of treatment, 35 the first month.—*Medical News, November 21, 1955.*

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X-Ray Motion Pictures

X-ray motion pictures, known technically as cinefluorography, made their commercial debut recently with the announcement that General Electric Co., *X*-ray Department, of Milwaukee, Wis., will soon turn out the first such units to be manufactured in this country.

Dr. James S. Watson, radiologist, and Sydney A. Weinberg, associate in radiology, of the University of Rochester Medical Center, have developed and designed the equipment.

University of Rochester *x*-ray scientists have had almost nine years of experience in the use of *x*-ray motion picture apparatus, designed and built by Doctor Watson and Mr. Weinberg. Under the direction of Dr. George H. Ramsey, professor of radiology, the Rochester group has made over 1,500 clinical *x*-ray motion pictures.

The new apparatus has been designed for use with conventional *x*-ray equipment, and can be used for taking pictures with the patient seated, standing or, as is desirable in many instances, lying down. The picture-taking area is 15″ by 15″, almost as large as the conventional 14″ by 17″ film. The device can be used with either 16 mm. or 35 mm. film and offers a speed range of 3-¾ to 30 frames per second.

Heart of the device is the f/0.71 lens, which is about 30 times faster than the lens on a newspaper photographer's camera. Also vital is the electronic triggering mechanism which turns the 100,000-to-130,000 volt *x*-rays on and off up to 30 times a second, in perfect synchronism with the motion picture camera, minimizing radiation dosage that the patient receives.

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That breeding, not feeding, determines the richness of cow's milk has been confirmed by studies at the University of Kentucky.

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Hemorrhagic Syndrome in Chickens

Since about 1950, broiler raisers have been experiencing losses in four to 12-week-old chickens from a disease which is characterized by hemorrhages in many tissues of the body. The first signs of illness noted are an increase in mortality, extreme weakness, pale combs, and diarrhea. Temperatures as high as 111.5 F. have been registered. Mortality has been variable ranging from a few birds to as high as 40%. One of the first published reports is that of Baker and Jaquette (Proc. 25th Ann. Pullorum Dis. Conf., Amherst, Mass. June 16-17, 1953). They observed the condition first in Delaware in about 1950. Gray, Snoeyenbos and Reynolds (*Jour. Am. Vet. Med. Assn.*, 125:144, 1954) report that it also appeared in Massachusetts in about 1950. It is now widespread in many broiler rearing areas.

Gray *et al.*, and Cover, Mullen, and Gill (*Cornell Vet.*, 45:366, 1955) describe the symptoms as given above. The gross pathological manifestations include the following: Extravasated blood in the subcutaneous tissues of the skin, legs, skeletal, and cardiac mucosa, intestinal mucosa, and subserosal connective tissue of the viscera. The blood may be almost watery. Hemorrhages under, and in the mucosa of the proventriculus and under the gizzard membrane are frequent. The ceca may be filled with large blood clots. A striking but infrequent site of hemorrhage involves the chambers of the eye. Conjunctival hemorrhages and epistasis may be seen. Small, yellow foci in the liver are sometimes present, and kidney damage is apparent. Profuse hemorrhages in the tissues and body cavities have not been observed. Marked alteration of the bone marrow is common. It is pink to yellow and shows marked hypoplasia and fatty replacement in the late stages.

The hematological studies made by Gray *et al.*, indicate that an aplastic anemia exists, and that the tendency to hemorrhage may be associated with a reduction in thrombocytes. Cover *et al.*, using the method of Quick (*Am. Jour Clin. Path.*, 10:222, 1940) determined the prothrombin time on 23 birds from ten outbreaks. These failed to show any indication of an increase in prothrombin time such as is seen in vitamin K deficiency.

The etiology of the disease remains obscure but it is evident from research work done to date that it is not due alone to vitamin K deficiency or to the use of drugs. References to hemorrhages due to vitamin K deficiency as related to feeding of drugs and soybean meal are given by Eveleth *et al.*, (*Jour. Am. Vet. Med. Assn.*, 123:38, 1953), Griminger *et al.*, (*Poultry Sci.*, 32:902, 1953), and Hare *et al.* (*Poultry Sci.*, 33:120, 1954). Attention is called to an anonymous report on hemorrhagic disease in VETERINARY MEDICINE, 48:479, 1953. The hemorrhagic disease described therein refers to hemorrhages due to vitamin K deficiencies as influenced by drugs and soybean meal, and is not the same disease as described herein. The report will serve to give the reader information which will aid in making a differential diagnosis. The reports by Gray *et al.* (*Jour. Am. Vet. Med Assn.*, 125:144, 1954), Cover *et al.* (*Cornell Vet.*, 45:366, 1955), and Forgacs and Carll (*Vet. Med.*, 50:172, 1955) are recommended for additional reading on the hemorrhagic syndrome described in this review.

The role of mycotoxicosis in producing this condition is being investigated by Forgacs and Carll and a preliminary report of their findings with other references on fungal toxins is published in *Vet. Med.*, 50:172, 1955. Using the same technics that they employ for isolation of toxic fungi from feeds which produced toxins responsible for losses in cattle (*Vet. Med.*, 50:210, 1955), these investigators have succeeded in isolation of similar toxic fungi from feed obtained on farms where the poultry disease existed and in producing the typical disease in chickens. Feed collected by them from farms where the disease was not present did not yield toxic fungi. Forgacs and Carll have demonstrated a new and promising approach to determination of the etiology of this disease. Their results emphasize an often overlooked fact that certain fungi are efficient biological producers of chemical products and that toxins produced by them may be similar chemically to poisons found in other substances.

At the 44th annual meeting of Poultry Science Association held at East Lansing, Mich., August 9-12, 1955, a number of papers were presented on hemorrhagic syndromes in chickens. No essential new facts were presented. Forgacs, Koch, and Carll verified previous results that toxins produced by certain fungi which may become established in feed will cause a hemorrhagic syndrome. They reported hemosiderin as a common finding in muscles of affected birds, and that kidney damage characterized by casts is common. Magg and Burmester reported that a strain of visceral lymphomatosis virus used by them for serial passage of the disease, produces intestinal hemorrhages, and that by serial passage the incidence of hemorrhages is increased to as high as 60%.

The practitioner who encounters flocks suffering from symptoms suggestive of this disease should be careful to exclude the many other conditions and diseases that cause hemorrhages before arriving at a diagnosis. Examples are: Coccidiosis, due to *Eimeria tenella* or to *E. necatrix;* vitamin K deficiencies; fowl cholera; soybean meal poisoning; and poisoning by excessive use of drugs. A careful inquiry into the feeding history will help to exclude soybean meal, sulfonamides, or antibiotics as responsible. Forgacs and Carll's results suggest that attention should be given to the source of feed, but great care should be taken to exclude all other possible causes before condemning the feed. Samples of feed should be submitted to competent analysts to determine if toxic strains of certain fungi may be responsible. The need for isolation of toxic fungi and the testing of these under laboratory conditions is stressed.

It is not my intention to leave the reader with the impression that feed contaminated with toxic fungi is the only cause of this disease. Forgacs and his associates have, however, succeeded in producing the field type of the disease in the laboratory by their technics. No doubt further research will clarify existing confusion by the establishment of a number of causes. The syndromes observed could be due to toxemias produced by a number of closely related chemical compounds some of which may be produced by microbial agents present in abnormal quantities in feed. One should not overlook the possibility of drugs such as antibiotics and sulfonamides so altering the intestinal flora of birds that toxin-producing microbes become predominant and responsible directly or indirectly for production of a hemorrhagic syndrome.

Alteration of Virus Disease Pathology

Xerosin is a microbial product of *Achromobacter xerosis,* N.Sp. which has been found to cause suppression lesions that accompany certain virus infections even though it does not have antiviral activity against the virus when tested *in vitro* or *in vivo.* Originally it was described by Groupé, Pugh and Levine (*Proc. Soc. Exp. Biol. & Med.,* 80:710, 1952) under the symbol APM. Groupé, *et al.* (*Jour. Bact.,* 68:10, 1954) described *Achromobacter xerosis* N.Sp. and renamed the substance xerosin. It is of possible interest to the poultry disease specialist because of its effect on nontransmissible pneumonia of mice caused by intranasal installation of Newcastle disease virus (NDV), described by Burnet (*Australian Jour. Exp. Biol. Med. Sci.,* 20:81, 1942). Groupé, *et al.* (*Science,* 118:187, 1953) found that this type of pneumonia in mice was definitely modified by subcutaneous injections of xerosin during the period of rapid extension of the lesion. No *in vivo* effect on NDV multiplication was noted. These observations and similar ones on the delay of onset of tonic convulsions in mice injected with influenza A or B virus, Groupé *et al.* (*Jour. Immunol.,* 74:249, 1955) suggest that substances other than those affecting viral multiplication may prove to be helpful in achieving effective therapy of viral diseases. As far as is known, xerosin has not yet been used in Newcastle disease in chickens to determine its effect on alteration of pathology of the disease.

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Feather Meal

A market for 50,000 tons of feathers, by-product of the poultry industry, is in feather meal according to *Farm Journal* for November 1955. "Could be that chickens knew it all along — at least those that pick one another," is an added comment.

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The use of 5 to 10 ml. of a 5% solution of copper sulfate has been recommended for years as a method of immediate pretreatment with an anthelmintic to assure its direct entry into the abomasum — bypassing rumen and reticulum. Recently, Dr. R. D. Turk, parasitologist at the School of Veterinary Medicine, Texas A. & M. College has recommended 60 ml. of a 10% solution of bicarbonate of soda for this purpose.

VETERINARY PARASITOLOGY

A. O. FOSTER, B.A., M.A., Sc.D.
Beltsville, Maryland

Piperazine Adipate an Effective Anthelmintic in Horses and Calves

Trials by Lee[1] in calves and by Poynter[3] in horses tend to confirm earlier reports[2,4] on the anthelmintic action of piperazine derivatives. In limited critical trials, all the ascarids, *Neoascaris vitulorum*, were removed from two calves that were given piperazine adipate in a drench at the rate of 0.1 gm. per lb. body weight. The drug was effective against both mature and immature worms but had no effect on the development of eggs. In 11 additional calves, dosages of 0.1 or 0.2 gm. per lb. resulted in the removal of numerous worms and a complete disappearance of ascarid eggs from the feces. The chemical was well tolerated in all cases; and in specific toxicity trials, no unfavorable reactions were observed in animals that received dosages of 0.1 to 0.3 gm. per lb. body weight.

On the basis of egg counts and one critical trial, Poynter found that a dosage of 10 gm. per hundred weight, administered in solution by stomach tube, was effective against the large roundworm of horses, *Parascaris equorum*, and the small strongyles, Trichonema spp. The drug was partially effective also against *Strongylus vulgaris* but had little or no action on *S. edentatus* or stomach bots, Gastrophilus spp. The chemical was well tolerated in all trials.—*F. D. Enzie.*

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Course of Trichostrongylus Infections in Sheep

Under experimental conditions[5], acute *Trichostrongylus axei* infections of lambs, unless they prove fatal during a six-week period immediately following the maturation of large numbers of worms (20-40,000), progress through a transitory subacute stage to a phase of chronic, low-grade parasitism with substantial recovery.

The acute stage is characterized by sudden weight loss and severe abomasitis.

The next phase is marked by poor condition but a shift toward weight gain, some loss of worms, and regression of generalized abomasitis. At this stage, the classical ulcers with raised white edges and inflamed craters are prominent.

The chronic stage is evident after nine or ten weeks of patent infection, and a few thousand worms persist for a year or more. It is marked by return to apparently normal rate of gain, low egg count, and clinical recovery, with many healing and healed "ringworm-like" abomasal ulcers.

The experiments on which these conclusions are based involved eight comparable lambs, all infected two months of age with 4,000 infective larvae daily for 15 days. Three lambs died during the third, fourth, and fifth weeks after the end of the exposure period; the other five were killed in intervals up to a year.

These facts emphasize the inherent, individual variation in susceptibility to *T. axei* infection.

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Meat Inspection Condemnations in Brazil

During the 14 years, 1936-1949, swine condemnations in federally controlled slaughter houses in central Brazil[6] included 42% of 3,406,835 kidneys and 22% of 1,972,907 livers on account of *Stephanurus dentatus*. Hydatid cysts were found in nearly 10% of the livers, but in only 149 lungs and 72 kidneys. There was an incidence of 6% *Cysticercus cellulosae*. Livers infested with *C. tenuicollis* varied from 1 to 6% in different years. Other principal causes of condemnation were tuberculosis and contusions.

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[1]Lee, R. P., The Anthelmintic Efficiency of Piperazine Adipate Against *Neoascaris vitulorum* (Goeze, 1782). *Vet. Rec.* 67:146, 1955.

[2]Leiper, J. W. G., The Piperazine Compound V.19 for the Removal of Ascaris and Oesophagostomum from the Pig. *Vet. Rec.* 66:596, 1954.

[3]Poynter, D., Piperazine Adipate as an Equine Anthelmintic. *Vet. Rec.* 67:159, 1955.

[4]Sloan, J. E. N., Kingsbury, P. A. and Jolly, D. W., Preliminary Trials with Piperazine Adipate as a Veterinary Anthelmintic. *Jour. Pharm. and Pharmacol.* 6:718, 1954.

[5]Gibson, T. E., Studies on *Trichostrongylus axei*. III. The Course of Untreated Infestations. *Jour. Comp. Path. and Ther.*, 65:143, 1955.

[6]Ribeiro, P., Causas de rejeicao de suinos abatidos no Brasil Central nos anos de 1936 a 1949. *Rev. Fac. Med. Vet.*, Sao Paulo, 4:421, 1951.

VETERINARY NUTRITION

MORRIS ERDHEIM, D.V.M.
Chicago, Illinois

University of Nebraska Feed and Nutrition Conference for the Feed Industry and Veterinary Profession — October 17th and 18th, 1955

The Conference designated in the head is organized so that the state veterinary association members meet one day and the feed men and nutritionists meet the next. Similar papers are delivered to both groups. This is the second year that this program prevailed, much to everybody's satisfaction. Last year the attendance for the veterinarians' day was 35. This year the registrations totaled 100. All those in attendance seemed extremely well pleased with this kind of meeting, and voted unanimously to continue on the same basis. The broad scope of subjects covered by the various speakers points to the valuable contribution of nutritional information to the practicing veterinarian. Following is the program presented at this year's meetings:

New Developments in Swine Nutrition
Dr. R. J. Meade, Animal Husbandry Department

Beef Cattle Nutrition
Dr. John Matsushima, Animal Husbandry Department

Hormones and Hormone-Like Substances
Dr. T. W. Dowe, Animal Husbandry Department

Dairy Cattle Feeding
Dr. Philip Kelly, Department of Dairy Husbandry

Grass Tetany
Dr. Connell Marsh, Animal Pathology Department

A New Technique for Studying Baby Pig Nutrition
Dr. George Young, Animal Pathology Department

A Unified Program in Nutrition and Management
Lloyd Larson, Executive Vice President, Midwest Feed Manufacturers Ass'n., Kansas City, Missouri

Soybean Oil Meal from a Feed Manufacturer's Standpoint
Dr. J. W. Hayward, Nutrition Director, Archer-Daniels-Midland Co., Minneapolis, Minnesota

Our Growing Knowledge of Poultry Nutrition
Dr. Harold Scott, University of Illinois, Urbana, Illinois

Good Nutrition and Good Health
Dr. Morris Erdheim, Director of Technical Development, Dawe's Laboratories, Inc.

Parasites and Profits
Dr. George Kelly, Animal Pathology Department

As It Looks To Me
Hugh Kelley, Ames Reliable Products Company, Ames, Iowa

During the meeting the following bits of interesting information were brought up: Doctor John Matsushima — Antibiotics for cattle are most effective when used at a 10 mg. per 100 lb. of weight level for calves weighing 400 to 600 lb. When 15 mg. per 100 lb. are used, growth is depressed. Dr. George Young — In grass tetany, the plasma magnesium is 0.2 to 0.6 mg., which is much lower than normal. Plasma magnesium fluctuates directly with outside temperatures. When cattle are placed on grass, the plasma magnesium level drops. Calcium magnesite is a good source of magnesium, and will prevent a drop in the level when cattle are put on grass. Dr. Hayward — When fish meal is combined with soybean oil meal it improves the protein contribution of the soybean oil meal to poultry rations. He emphasized that the quality of soybean oil meal varies considerably in different batches of this product. In 23 tests conducted on broilers fed high energy rations having between 900 and 1,000 calories per pound of feed, no improvement could be obtained by adding methionine to the ration. Good quality soybean oil meal was used in the feeds for these tests.

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

THE MERCK VETERINARY MANUAL, by *selected authors,* and edited by the Merck professional staff, (Dr. O. H. Siegmund, Editor-in-Chief). 1400 pages, pocket size, thumb index. Merck & Co., Inc., Rahway, New Jersey, publishers.—Price $7.50.

The Merck Veterinary Manual challenges the reviewer to express adequately its potential value to the professional and to the livestock industry. The book has precedence only in a similar text developed and published previously by the Merck people, and now in its 8th edition. The Merck Manual of Diagnosis and Therapy has wide acceptance by the medical and allied professions.

This new book, signature copies of which were distributed at the Minneapolis A.V.M.A. convention last summer, has been prepared "to serve the veterinary profession with a concise, complete handbook of diagnosis, therapy, and materia medica of disease in animals and poultry." It has not been prepared for laymen. Text material is technical and professional.

Contents is divided into five parts, 21 sections, and 389 principal chapters on disease, therapy, management, and recommended procedures for control and treatment. Material is presented in a style that is fixed throughout the book and is brief. In fact, in some instances comprehensiveness has been sacrificed for brevity which will please some but be criticized by others.

The editors are conscious of the fact that space given any particular subject might not, in itself, classify properly the importance of the specific entity in all areas. In general, choice and selection have been made considerately. The scope of the text is all-embracing and meticulously indexed. Over 200 contributors have cooperated, insuring accurate and up-to-date information without embellishment.

The book is referred to as "pocket size" (page size 4¼ in. x 6¾ in.) but its 1,400 page bulk would make quite a pocket full (2 in. thick).

Prescriptions, grouped into therapeutic categories, appear at the end of each section. They are numbered to correspond to the Rx symbols in the text. Dosage quantities are expressed in the metric system, generally, with apothecary equivalents. Wherever possible, doses are stated on a unit-per-pound basis; when impractical, are given after the standard abbreviations for species. Generic names are employed, generally, for drugs and when proprietary agents are named, they are treated as proper nouns.

Part V, Addendum deals with immunization procedures, routine of medication, radiology, laboratory procedures (office), listings of alternative proprietary preparations, and a carefully prepared index. The book should be available and within easy reach. This reviewer has found it of immense value for quick reference.

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RUSSIAN COMFREY, by *Lawrence D. Hills.* 167 pages, 20 plates, four tables. Faber and Faber Ltd., London, publishers, 1953.—Price $2.50 (approx.).

Russian comfrey is proving to be an amazing perennial fodder and compost crop, producing over 100 tons per acre of high-grade food for cattle, horses, sheep, pigs, poultry, and goats. Although utilized in various ways for well over a century, the tremendous potentialities of the plant have not begun to be realized.

Russian comfrey may be used not only as animal feed, but for human food as well. The amateur gardener may use the plant in building compost; the backyard poultryman may find it a valuable green feed for his chickens.

In this book, the author reports his conclusions after investigating the plant for four years. He suggests its use by the farmer, emphasizes that it may be cut from six to eight times yearly, indicates that the plant is hardy and easy to establish, and compares its excellent nutrient values to those of conventional feeds.

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One quart of milk will provide all the essential amino acids required daily in the average man's diet to reach and maintain protein nitrogen balance.—*S. N. L., October 8, 1955.*

Ralston-Purina Announces Research Fellowship Awards for 1956-57 School Year

The Ralston Purina Company has announced its Research Fellowship Awards program for 1956-57, under which ten outstanding agriculture college students will be able to do graduate work. Application blanks and rules of the annual program are now being sent to agriculture colleges throughout the United States and Canada.

Selection of the ten winning students will be made, as in the past, by a committe of five, composed of a representative from the Poultry Science Association, the American Veterinary Medical Association, the American Dairy Science Association, the American Society of Animal Production, and the Association of Land Grant Colleges. Three Fellowships will be awarded in animal husbandry, three in dairy husbandry, three in poultry husbandry, and one in veterinary science. Each Fellowship amounts to $1560.

The purpose of the program is to help train outstanding college students for leadership in the science of livestock and poultry production. The first Fellowships were granted for the 1949-50 school year.

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To assure inclusion, copy must be supplied by the 5th of the month preceding date of issue (January 5 for February issue; February 5 for March issue, etc.).

WANTED VETERINARIAN: Assistant in Chicago small animal hospital. Furnished small apartment with the position. Excellent opportunity. State experience etc. in first reply. Address No. 265 care VETERINARY MEDICINE.

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FOR SALE: Florida, well established, completely equipped small animal hospital, only veterinarian in county and town of 10,000. Excellent opportunity. Reason for selling, other business interests. Address No. 269 care VETERINARY MEDICINE.

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FOR SALE OR LEASE: Completely equipped, long established, small animal hospital and practice. Modern equipment, new building. Only veterinary practice in Illinois city of 50,000. Address No. 271 care VETERINARY MEDICINE.

WANTED: March, August and September 1954, February, March, and October 1955 issues of VETERINARY MEDICINE. Your subscription will be advanced one month for each copy. Mail to VETERINARY MEDICINE, Suite 803 Livestock Exchange Bldg., Kansas City 2, Missouri.

WANTED ASSISTANT: Graduate veterinarian willing to work on commission, who can give undoubted references as to qualifications, good character, good personality, physically able, well qualified in treating small animals including setting bones and trimming ears. Nice sleeping quarters at new clinic. A (man) veterinarian willing to stay close on duty. Amount of work such a man could soon be doing is just about unlimited. Address No. 272 care VETERINARY MEDICINE.

FOR SALE: Mixed practice in Midwest, established 20 years. General 60%; small animal 40%. Average gross approximately $36,000. Hospital in good location completely rebuilt and remodeled recently. Real estate and all equipment including *x*-ray priced at real estate value plus ½ of annual income. $15,000 will handle. Owner selling because of other interests. Address No. 273 care VETERINARY MEDICINE.

HELP WANTED: Co. Veterinarian. Ontario County. $4400.00. New York State residents. Exam Feb. 17, 1956. Last date for filing applications Jan. 25, 1956. Applications and further information available at office of Civil Service Commission, Court House, Canandaigua, New York.

WANTED TO PURCHASE: Copy of each of the following books: Williams' Surgical Operations by A. G. Danks, Animal Dentistry and Diseases of the Mouth by L. A. Merillat, Veterinary Surgical Operations by L. A. Merillat. Contact Dr. W. H. Wright, P.O. Box 327, Aiken, South Carolina.

Polyarthritis resulting from erysipelas infection is a major cause for condemnation of swine carcasses slaughtered in establishments under federal inspection.

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The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore, all progress depends on the unreasonable man.—*George Bernard Shaw.*

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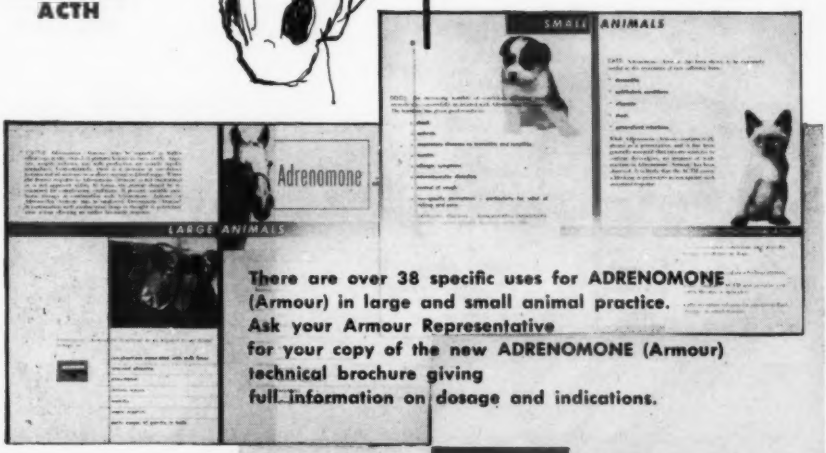

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Increases in Salary for Federal Veterinarians

The U.S. Civil Service Commission has approved a request initiated by the Agricultural Research Service for a further increase in the beginning salary of GS-7 veterinary positions from $4,930. to $5,200. per annum.

In the future, veterinarians with less than one year of professional experience will be appointed at the $5,200. salary rate and will have excellent opportunities for advancement to grade GS-9 at $5,440. per annum upon the satisfactory completion of six months' service and training in the Agricultural Research Service. Those who have had at least one year of professional veterinary experience may be appointed initially in grade GS-9 at $5,440. per annum.

Openings for veterinarians exist on both meat inspection and livestock disease control and eradication activities. Veterinarians who are interested in employment in grade GS-7 or GS-9, depending upon their qualifications as indicated above, are encouraged to communicate with the Personnel Division, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C., or they may contact the nearest Inspector in Charge, Federal Meat Inspection Service, or Federal Veterinarian in Charge, Livestock Disease Control and Eradication Work or other veterinary activities of the Agricultural Research Service.

▾ ▾ ▾

Parakeratosis, a serious skin ailment of swine, has been traced to a nutritional imbalance and may be prevented or relieved by the addition of 100 parts per million of zinc to the hogs' diet, according to the Wisconsin Research group.

▾ ▾ ▾

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Quick relief for Bone,
Bursal or Tendon Lameness
Single Bottle.....$2.00
3 and 1 free.....5.00
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Bovine Brucellosis Statistics

Fiscal year 1955:

Herds tested	984,541	
Cattle tested	14,186,241	
Infected herds	143,690	(14.6%)
Reactors	365,247	(2.6%)
Calves vaccinated	4,381,397	

Reactor percentage of those tested is unchanged from last year, however 5,000,000 more animals in approximately 300,000 herds were blood tested in 1955 than in 1954. Increased use of the milk ring test as a screening procedure may have influenced upward this year's incidence rate.

▾ ▾ ▾

Dr. Austin Smith, editor of the *Journal of the American Medical Association,* urged pharmaceutical manufacturers to adopt the highest standards of evaluation for any new product offered for treatment or prevention of disease. Rapid development of new products resulting from application of new research findings has confused accepted therapeutic regimen of physicians. New principles for advertising have been adopted by scientific councils of the A.M.A. designed to elevate standards of claims of manufacturers.

there's no substitute for reliability . . .

Therapogen is a dependable effective germicidal agent suitable for nearly every instance. Its freedom from side effects and toxicity in proper dilutions provides a reliable cleansing action practically and inexpensively.

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A late penicillin product is penicillin V. Its particular value is its acid nature. It is acid resistant and passes through the simple stomach of the acid producing patient unchanged. This seems to mean that its oral use will be of particular value in many serious infections. It is absorbed in the alkaline medium of the small intestine. This compound has not been observed to result in the serious systemic reactions sometimes following the use of other penicillins parenterally administered.

▾ ▾ ▾

Incidence of rabies in California and New York is of increasing concern to public health authorities. Largest numbers of wildlife cases have been reported as occurring in skunks.

▾ ▾ ▾

More crop lands are taken out of production each year by urban and highway expansion than are brought into production by reclamation of arid lands.—*S. N. L., October 1, 1955.*

▾ ▾ ▾

Percentage of tuberculosis reactors among cattle raised slightly, from 0.11% in 1954 to 0.12% in 1955; fewer cattle were tested during the past year.

Helps Protect the men who protect the herds of America

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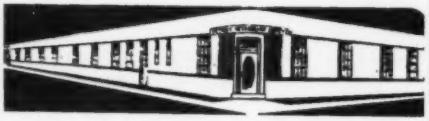

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DETROIT 32, MICHIGAN

Fertility of Bulls

Psychological factors, such as rough treatment just before service or collection of semen, may diminish the fertility of a bull, W. R. Haubrich, veterinary practitioner of Claremont, N. H., states in *Cornell Vet.* 45:304 (July) 1955. In describing aids to conception, the veterinarian reports that it is important to treat with antibiotics many common infections in the genital tract, and especially cervicitis which leads to induration. One method of treatment which he recommends as "easy and apparently highly effective" is the insertion following service of a furacin® suppository into the cervix entrance where "it can remain in position for several days."

The practitioner directs his remarks to the breeder and practical farmer noting that "lack of breeding efficiency is probably the most important single factor disturbing the economics of dairy cattle husbandry."

▼ ▼ ▼

Practical livestockmen generally believe large supplies of market hogs to be the principal factor responsible for the lowest price to growers since pre-World War II.

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To maintain unrestricted milk flow and provide antiseptic protection is of first importance in the care of Injured teats, Scab teats, Stenosis, and in post operative therapy. Dr. Naylor Medicated Teat Dilators are SULFA-impregnated surgical dressings for the teat canal.

They act both medically and mechanically to provide prolonged broad spectrum germicidal activity and gentle non-irritating support to traumatized sphincter and teat mucosa. They promote normal tissue repair with a minimum of altered milking function of the streak canal. Positive retention — fit large or small teats.

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Cost of Vesicular Exanthema Control

Since 1952, approximately $12,000,000. of federal and state money have been expended in the control of vesicular exanthema in swine, according to a report in *Farm Journal*, November 1955. These figures represent tax money expended and do not include losses to growers, which have been substantial, due directly to the disease ravages among their herds, and indirectly as depressed prices for pork products.

It is also stated in this that disease control officials agree that despite quarantines, and as long as the disease exists in this country, it constitutes a serious threat to the swine industry.

▼ ▼ ▼

The Senate subcommittee on atomic energy heard Dr. H. B. Tukey, chief horticulturist at Michigan State University, state that with the use of radioisotopes researchers have established the fact that 95% of soluble fertilizers applied to the leaves of crops are used by the plants. Only 10% of the fertilizer applied to the soil is consumed.

▼ ▼ ▼

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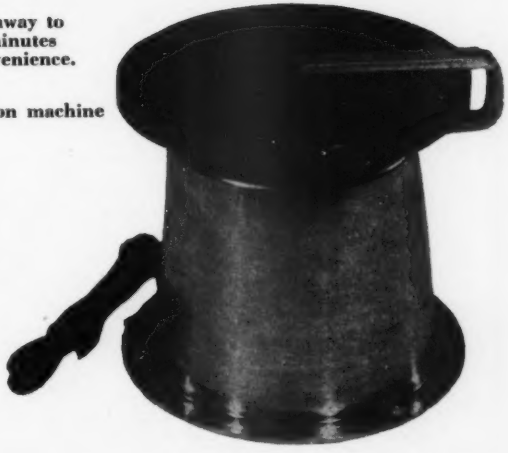

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Dr. L. T. Giltner
1884-1955

Dr. Leigh T. Giltner, who retired from the U. S. Department of Agriculture on February 26, 1954, after a career of 48 years as a veterinarian and administrator in animal disease research, died after a prolonged illness, November 17, at his home, 4002 Twenty-first Street, N. E. in Washington, D. C. He was 71 years of age.

Doctor Giltner, who was born in Ithaca, N. Y., received his Doctor of Veterinary Medicine degree from Cornell University in 1906 and joined the USDA in that year as a veterinary inspector, working in Illinois and North Dakota until his transfer to Washington in 1914. In 1932, he was appointed to the position he held until his retirement as Assistant Chief of the Animal Disease and Parasite Research Branch of the Agricultural Research Service. Before the 1953 reorganization of the Department, this was the Pathological Division of the Bureau of Animal Industry.

Doctor Giltner was recognized widely as an authority in his field of veterinary medicine. Most of his nearly 50 scientific papers described research progress against animal infections, particularly those borne by insects.

Dr. L. T. Giltner

He conducted extensive research against infectious equine encephalomyelitis, and was a pioneer in the study of anaplasmosis.

He was a member of the American Veterinary Medical Association, Society of American Bacteriologists, D. C. Veterinary Medical Association, and the Conference of Research Workers in Animal Diseases in North America. He is survived by his wife, Mrs. Laura M. Giltner; and by a daughter, Mrs. Harriet G. Yeatman; a son, Bernard L. Giltner; and two grandchildren.

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MEETING CALENDAR

Pennsylvania University Annual Conference for Veterinarians. University of Pennsylvania, School of Veterinary Medicine, Philadelphia, Pa., January 3-4, 1956. M. W. Allam, 39th and Woodland, Philadelphia, dean.

Cornell University Conference for Veterinarians. Annual. New York State Veterinary College, Ithaca, N. Y., January 4-6, 1956. W. A. Hagan, dean, Cornell University, Ithaca.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 4-6, 1956. R. L. Henry, 50 E. Broad St., Columbus 15, secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Hotel Mayo, Tulsa, Okla., January 8-10, 1956. C. H. Faulks, 3421 N.W. 20th St., Oklahoma City, secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., January 11-13, 1956. L. M. Borst, 3315 Shelby St., Indianapolis, secretary.

Wisconsin Veterinary Medical Association. Annual meeting. Schroeder Hotel, Milwaukee, Wis., January 11-13, 1956. B. A. Beach, 1215 Vilas Ave., Madison, secretary.

Tennessee Veterinary Medical Association. Annual meeting. Nashville, Tenn., Jan. 15-16, 1956. H. W. Hayes, 734 Broadway, Northeast, Knoxville, secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Utah, January 16-18, 1956. Edward A. Tugaw, 3015 South State St., Salt Lake City, secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Ft. Des Moines, Des Moines, Ia., January 17-19, 1956. F. B. Young, Waukee, secretary.

Michigan State University Postgraduate Conference for Veterinarians. Michigan State University College of Veterinary Medicine, January 18-19, 1956. C. F. Clark, East Lansing, dean.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., January 22-24, 1956. Wilson B. Bell, 210 Clay St., Blacksburg, secretary.

California State Veterinary Medical Association. Mid-winter conference. School of Veterinary Medicine, University of California, Davis, January 23-25, 1956. Charles S. Travers, 3004 16th St., San Francisco, executive secretary.

Minnesota Veterinary Medical Association. Annual meeting. St. Paul, Minn., Jan. 23-25, 1956. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul, secretary.

North Carolina State College Annual Conference for Veterinarians. North Carolina State College, Raleigh, N. C., January 24-27, 1956. C. D. Grinnells, State College Station, Raleigh, chairman.

Maryland State Veterinary Medical Association. Winter meeting. Lord Baltimore Hotel, Baltimore, Md., January 26-27, 1956. John D. Gadd, Cockeysville, secretary.

Oregon State Veterinary Medical Association. Winter meeting. Multnomah Hotel, Portland, Ore., Jan. 27-28, 1956. E. L. Holden, Oswego, secretary.

Ontario Veterinary Medical Association. Annual meeting. Royal York Hotel, Toronto, Ont., Jan. 27-28, 1956. G. A. Edge, Box 37, Postal Station "F", Toronto 5, secretary.

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Louisiana State University Annual Conference for Veterinarians. Louisiana State University, Baton Rouge, La., January 31-February 1, 1956. W. T. Oglesby, Department of Veterinary Science, Louisiana State University.

Kansas Veterinary Medical Association. Annual meeting. Baker Hotel, Hutchinson, Kan., February 5-7, 1956. K. Maynard Curts, 70 Central Ave., Kansas City, Kan., secretary.

Texas Veterinary Medical Association. Annual meeting. Mineral Wells, Tex., February 5-7, 1956. Paul B. Blunt, 710 Maverick Bldg., San Antonio, secretary.

Illinois State Veterinary Medical Association. Annual meeting. Hotel LaSalle, Chicago, Ill., February 20-22, 1956. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, secretary.

Colorado A. & M. Annual Conference for Veterinarians. Glover Veterinary Hospital, School of Veterinary Medicine, Colorado A. & M. College, Ft. Collins, Feb. 20-26, 1956. O. R. Adams, head Veterinary Clinics and Surgery, chairman.

Alabama Veterinary Medical Association. Annual meeting. Whitley Hotel, Montgomery, Ala., Mar. 18-20, 1956. M. K. Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, secretary.

Washington State College Annual Conference for Veterinarians. College of Veterinary Medicine, State College of Washington, Pullman, Wash., Apr. 2-4, 1956. John R. Gorman, chairman.

▼ ▼ ▼

—DEATHS OF VETERINARIANS—

Jonathan C. Bartholomew, Berwyn, Pa., GR '14, Aug. 3, 1955.

Edward V. Beaumont, Kansas City, Kan., KCV '11, August 1955.

Harry LeRoy Bennett, O'Neill, Nebr., ST JOS '23, Aug. 10, 1955.

Walter J. Biehl, Montoursville, Pa., AMER '98, Aug. 21, 1955.

Edwin B. Campbell, Komoka, Ont., ONT '52, Oct. 12, 1955.

Carl Cozier, Bellingham, Wash. CVC '05, died recently.

Albert J. Crane, Glens Falls, N. Y., COR '37, Sept. 13, 1955.

Joseph H. Dennen, Exeter, R. I., HAR '98, June 1955.

Oscar H. Eliason, Madison, Wis., ONT '01, Apr. 21, 1955.

Henry E. Ellis, Millbrook, Ont., ONT '14, Aug. 14, 1955.

Walter W. Fleenor, Wahpeton, N. Dak., IND '15, Sept. 16, 1955.

John A. Fries, Durand, Mich., GR RAP '13, Aug. 9, 1955.

Hugh Gaw, North Attleboro, Mass., MCG '03, Oct. 13, 1955.

R. D. Gilbert, Gettysburg, Ohio, OSU '16, date unknown.

William J. Glasgow, Springfield, Mass., ONT '94, Aug. 4, 1955.

W. G. Hassell, Graville, Ill., KCV, Aug. 8, 1955.

Fred A. Hines, Creston, Iowa, KCV '13, Aug. 7, 1955.

Alexander Hughes, Orangeville, Ont., ONT '13, Aug. 5, 1955.

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- to control nausea of worming
- whenever a general anti-nauseant is required

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Foster H. Hume, Butler, Mo., KCV '11, Aug. 15, 1955.

George G. Jelen, Marysville, Ohio, OSU '23, Sept. 20, 1955.

William E. Kreider, Wadsworth, Ohio, OVC '94, July 22, 1955.

John Laughlin, Lockport, N. Y., COR '20, Aug. 17, 1955.

R. Jay MacDonald, Jamaica, N. Y., ONT '07, July 17, 1955.

Clifford H. Milks, Owego, N. Y., COR '30, Aug. 14, 1955.

Fred Morphy, Toronto, Ont., ONT '05, June 27, 1955.

George E. Norman, Jasper, Ind., IND '14, July 28, 1955.

Harold D. O'Brien, Russell, Kan., KSC '11, Aug. 11, 1955.

J. W. Ornduff, Albia, Iowa, KCV '08, July 8, 1955.

Warner Overfield, Hillsboro, Ind., TH '18, Sept. 30, 1955.

Ernest C. Riddell, Drew, Miss., KCV '09, date unknown.

Christian A. Sotaaen, Windom, Minn., MCK '09, Sept. 11, 1955.

Fred A. Stevenson, Princeton, Ky., TH '17, Oct. 1, 1955.

Samuel R. Tufts, Morristown, N. J., EDN '93, Aug. 31, 1955.

John C. Walker, Holden, Mo., TH '12, Apr. 15, 1955.

Harry Wenborne, Allentown, Wis., OVC '94, date unknown.

Hulbert Young, Baltimore, Md., UP '00, Sept. 19, 1955.

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INDEX TO ADVERTISERS
In This Issue of Veterinary Medicine

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Affiliated Laboratories VI
Armour Veterinary Laboratories XXXI
Arnold Laboratories XXXV
Ashe Lockhart, Inc. ..... XLVI-XLVII

Babson Brothers Company XXII
Bard-Parker, Inc. XXXII

California Veterinary Supply XXX
Carter-Luff Chemical Company XXXII
Chatham Pharmaceuticals, Inc. XVIII
Coast Fisheries XXVIII
Corn States Laboratories ..... Fourth Cover
Curts Laboratories XXIX
Cutter Laboratories XII

Dalare Associates XXXIX
Detroit Veterinary Supply XXXVI
Diamond Laboratories XXXVIII
Drugs For Veterinary Medicine XXIX

Fort Dodge Laboratories ..... IV-XVII
Fromm Laboratories IX

Gaines Food Company XIII

Hamilton Pharmacal Company, Inc. XXXV
Haver-Glover Laboratories XLVIII
Heldenbrand & Son XXX
Hill Packing Company XLI

Jensen-Salsbery Laboratories ..... Second Cover

Lederle Laboratories Division ..... XX-XXI

Mason Fence Company XLV
Meyer Estate, Theo. XXXIII

Naylor Company, H. W. XXXVI
Nicholson Manufacturing Company XLII
Norden Laboratories XXVI
Nutritional Minerals XXXVI

Oster Manufacturing Company, John XLII

Parke, Davis and Company III
Pfizer and Co., Chas. ..... XXIII-XLIII-XLIV
Pitman-Moore Company ..... XIV-XXVII
Publishers' Authorized Bindery Service XL

Research Laboratories XXXVII

Sharp and Dohme V
Silent Partner Associates ..... XIV-XV
Squibb and Sons, E. R. ..... X-XI
Sterling Research Corporation XXXIX
Sun Ray Hair Preparations XXXIX

Upjohn Company, The XXXIV
U. S. Chemical Company XIX

Vitamineral Products Company XVI

Winthrop Laboratories ..... Third Cover

Yellen Company, David XXXIII

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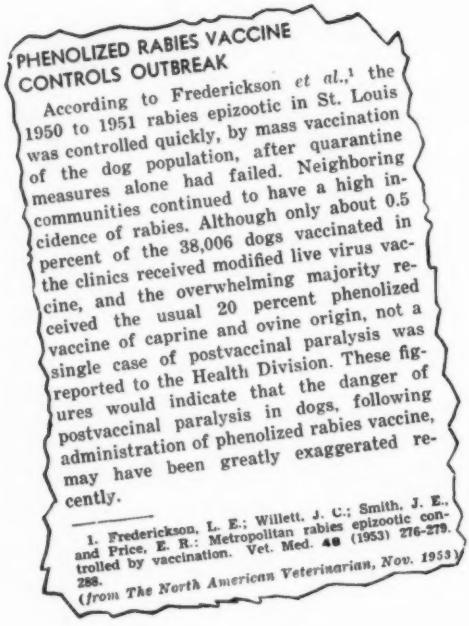

PHENOLIZED RABIES VACCINE CONTROLS OUTBREAK

According to Frederickson *et al.*,[1] the 1950 to 1951 rabies epizootic in St. Louis was controlled quickly, by mass vaccination of the dog population, after quarantine measures alone had failed. Neighboring communities continued to have a high incidence of rabies. Although only about 0.5 percent of the 38,006 dogs vaccinated in the clinics received modified live virus vaccine, and the overwhelming majority received the usual 20 percent phenolized vaccine of caprine and ovine origin, not a single case of postvaccinal paralysis was reported to the Health Division. These figures would indicate that the danger of postvaccinal paralysis in dogs, following administration of phenolized rabies vaccine, may have been greatly exaggerated recently.

1. Frederickson, L. E.; Willett, J. C.; Smith, J. E., and Price, E. R.: Metropolitan rabies epizootic controlled by vaccination. Vet. Med. **46** (1953) 276-279, 288.

(from The North American Veterinarian, Nov. 1953)

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